A Climatology of Hurricanes for Canada
Improving Our Awareness of the Threat

Part 2: Storm Impacts

Funded by the Search and Rescue New Initiative Fund Project (NIFID # 2002016)

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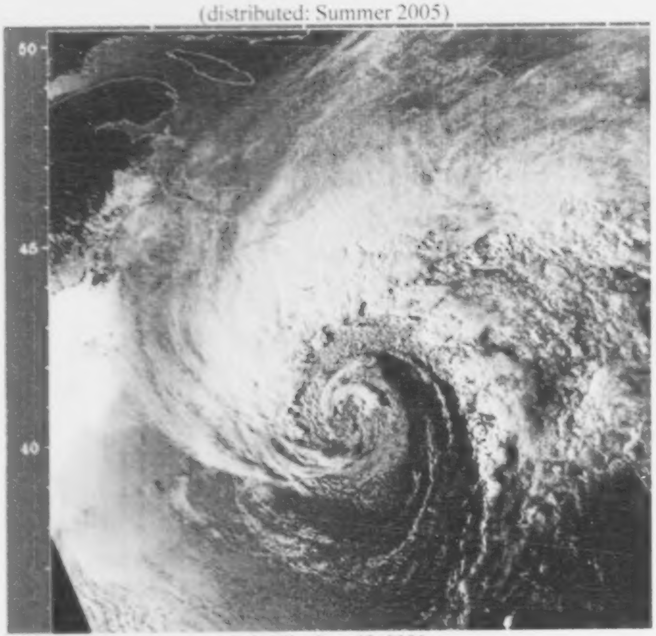
(distributed: Summer 2005)



Gabrielle–Sept 18, 2001

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PREFACE

Atmospheric scientists are in universal agreement that the Atlantic basin has returned to an extended period of heightened hurricane activity, as evidenced by this past decade reporting the highest frequency of tropical cyclones of any decade on record. While extensive climatologies of hurricanes and tropical storms exist for the entire Atlantic or sub-basins (such as near the Caribbean or U.S. east coast), few statistics have been developed for the Canadian threat of tropical cyclones.

At the time that this climatology was being prepared in May 2003, Rebecca Hanson was publishing her undergraduate thesis, "Actual Versus Perceived Risk Due to Hurricanes in Nova Scotia" (Department of Geography, Saint Mary's University, Halifax, Nova Scotia). Two notable conclusions were drawn by Ms. Hanson. First, although "people who had experienced a hurricane cited that impact due to hurricanes was highly likely, they also felt that damage due to hurricanes was only somewhat likely." Second, "in the event of a major landfalling hurricane, a major concern to emergency measures organizers evidenced in the survey results was the participants' low awareness of preparedness measures constructed by federal, provincial, and local governments."

These words seemed prophetic when, five months later on September 29, the poor response of a mostly unprepared public was witnessed during the landfall of Hurricane Juan, the worst hurricane in modern history for Halifax and much of Nova Scotia and Prince Edward Island. The upswing in Atlantic hurricane activity, compounded by a Canadian public who is, as a whole, poorly educated on the impacts of hurricanes, constitute the key ingredients for a natural hazard to become a natural disaster. Clearly, a much greater awareness is required to keep Canadians and their property safe.

This project addresses the knowledge-deficiency through the compilation of an extensive 20th century climatology of tropical cyclones and their threats to Canada. For a climatology of this magnitude, this project represents a good first start. In all cases, the law of diminishing returns is at work with increasing effort required to mine older data. For example, the data for the second half of the 20th century is considered more robust because of the advent of air reconnaissance near the end of the Second World War and satellite imagery in 1960. As a result a separate climatology for the period 1951-2000 has been included. A 10-year Atlantic hurricane dataset reanalysis project is underway in the United States and will not likely be finished before 2007. Once it is completed, this Canadian climatology will need to be redeveloped. As well, the climatology of impacts presented is an ongoing work-in-progress as it employs proxy and anecdotal data sets.

Part 1 is a detailed climatology of tropical cyclone tracks and intensities for the full Atlantic basin, the Canadian Hurricane Centre Response Zone, Canada, and her territorial waters. For Canadian inland areas, the climatology is broken down by provinces, cities, and forecast areas. Because of their rarity and significance, all landfalling hurricanes on record (1851-2003) are included. In the marine environment of the Great Lakes, St. Lawrence River, and Atlantic Canada, the climatology is broken down by forecast areas and also bulk regional groupings (Newfoundland waters; Labrador waters; Gulf of St. Lawrence waters; Bay of Fundy waters; etc.).

Part 2 is a detailed climatology of tropical cyclone impacts in Canada and her waters during the period 1900-2004 (1900 was included because of the significance to Canada of the Great Galveston Hurricane). Data sources include major Canadian newspapers, the Canadian Disaster Database, and the Canadian Hurricane Centre archives, to name a few. Each year is highlighted with a map showing the tracks of all tropical cyclones impacting Canada or her waters, storm and impact summary information, and detailed impact reports. Where possible, fatality and damage statistics are provided. It must be recognized that these statistics should not be viewed as complete because of the time constraints to conduct such research. However, it is believed that the majority of significant impacts, including fatalities and damages, have been captured.

Of the hundreds of storms for which information has been compiled, two storms rise above the rest in terms of recorded information: Hurricane Hazel (1954) and Hurricane Juan (2003). Hazel was the most devastating Canadian hurricane with respect to inland fatalities, and Juan was the most recent reminder of what happens when a hurricane hits a populated area. Accordingly, both Hazel and Juan have been treated more comprehensively, including photographs.

Future work includes:

- the ongoing revision of the data presented in the report
- completion of extratropical track extensions of tropical cyclones (underway)
- climatology of tropical cyclone gale radii
- climatology of tropical cyclone rainfall
- climatology of tropical cyclone storm surge

This project was funded by the Canadian National Search and Rescue Secretariat's New Initiatives Fund (Project - NIFID # 2002016)

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NOTES

Reference Sources

NEWSPAPERS

Code		*Newspaper*
(ET)	-	*Evening Telegram, St. John's, NL*
(G)	-	*The Guardian, Charlottetown, PEI*
(HH)	-	*Chronicle Herald, Halifax, NS*
(TJ)	-	*Telegraph Journal, Saint John, NB*
(MG)	-	*The Gazette, Montreal, PQ*
(TS)	-	*Toronto Star, Toronto, ON*
(GM)	-	*Globe and Mail, Toronto, ON*
(DFP)	-	*Dartmouth Free Press, Dartmouth, NS*
(KWS)	-	*Kingston Whig Standard, Kingston, ON*
(BB)	-	*Bridgewater Bulletin, Bridgewater, NS*
(LPE)	-	*Lunenburg Progress Enterprise, Lunenburg, NS*
(OC)	-	*The Ottawa Citizen, Ottawa, ON*
(TR)	-	*The Register, Berwick, NS*

BOOKS

Code		*Book*
(SNL)	-	*Shipwrecks of Newfoundland and Labrador* *Frank Galgay and Michael McCarthy,* *Creative Book Publishing, 1987(v. 1), 1990(v. 2), 1995(v. 3), 1997(v. 4)*
(SNS)	-	*Shipwrecks of Nova Scotia* *Jack Zinck,* *Lancelot Press Limited, 1975(v. 1) & 1977(v. 2)*
(IPS)	-	*In Pearl On The Sea: Shipwrecks of Nova Scotia* *Robert C. Parsons,* *Pottersfield Press, c2000*
(ADG)	-	*Atlantic Diver Guides* *David N. Barron,* *Atlantic Diver, 1988(v. 1-4)*
(TOS)	-	*Toll of the Sea: Stories from the Forgotten Coast* *Robert C. Parsons,* *Creative Publishers, 1995*
(WOS)	-	*The Wake of the Schooners* *Robert C. Parsons,*

Code		*Book*
		Creative Publishers, 1993
(WW)	-	*Wind and Wave: Sea Tales from Around Our Coast* *Robert C. Parsons* *Creative Publishers, 2003*

INTERNET

Code		*Details*
(GGHC)	-	*The Great 1900 GalvestonHurricane in Canada* *http://www.magma.ca/~jdreid/great_1900_hurricane.htm*
(LAS)	-	*Lost at Sea http://www.lostatsea.ca*
(NLR)	-	*Newfoundland Roots http://home.cogeco.ca/~nfldroots/fata1924.htm*

MISCELLANEOUS

Code		*Details*
(CDD)	-	*Canadian Disaster Database, Ottawa, ON*
(CHC)	-	*Canadian Hurricane Centre, Dartmouth, NS*
(NSDNR)	-	*Nova Scotia Department of Natural Resources, NS*
(USCG)	-	*United States Coast Guard, Washington D.C., US*
(CSC)	-	*Community Services Council, NL*
(NSD)	-	*Northern Shipwreck Database*
(MTB)	-	*The October 15-16, 1954 Storm, "Hurricane Hazel" in Ontario* *Meteorological Service of Canada Archives, CIR-2606, TEC-210, Jan 21 1955* *A. H. Mason, M. K. Thomas, and D. W. Boyd*
(D)	-	*A Study of Blowdown in Nova Scotia, October 1958* *G. D. Dwyer*

A LIST OF ADDITIONAL SOURCES WAS COMPILED FOR HURRICANE JUAN

Code		*Details*
(CBC)	-	*Canadian Broadcasting Corporation*
(HDN)	-	*Halifax Daily News, Halifax, NS*
(TDN)	-	*Truro Daily News, Truro, NS*
(CCG)	-	*Canadian Coast Guard*
(NR)	-	*Nature's Resources (NS government magazine)*
(HOC)	-	*Halifax Outdoor Club, Halifax, NS*
(DL)	-	*Dartmouth Laker, Dartmouth, NS*
(HRM)	-	*Halifax Regional Municipality, Halifax, NS*
(TR)	-	*The Rucksack, Halifax, NS*

Code		Details
(CNR)	-	Canadian National Railway
(NSCC)	-	Nova Scotia Community College, Halifax, NS
(MSVU)	-	Mount Saint Vincent University, Halifax, NS
(DAL)	-	Dalhousie University, Halifax, NS
(SMUT)	-	Saint Mary's University Times, Halifax, NS
(EZ)	-	EnviroZone
(IBC)	-	Insurance Bureau of Canada
(NSPI)	-	Nova Scotia Power Incorporated, Halifax, NS
(NSEMO)	-	Nova Scotia Emergency Measures Organization, Halifax, NS
(LHD)	-	Lighthouse Digest
(TEN)	-	The Evening News, New Glasgow, NS
(CYCN)	-	Charlottetown Yacht Club Newsletter, Charlottetown, PEI
(TBE)	-	The Bulletin Enterprise
(GPEI)	-	Government of Prince Edward Island
(ADNSPEI)	-	Anglican Diocese of Nova Scotia and Prince Edward Island, Halifax, NS
(CFIA)	-	Canadian Food Inspection Agency
(DFNS)	-	Dairy Farmers of Nova Scotia
(COAST)	-	Coast Magazine, Halifax, NS
(TB)	-	Truro Bureau, Truro, NS

ADDITIONAL SOURCES FOR 2004 STORMS

Code		Details
(TWS)	-	The Windsor Star, Windsor, ON
(SS)	-	Sudbury Star, Sudbury, ON
(NP)	-	National Post, Don Mills, ON
(SP)	-	Star-Phoenix, Saskatoon, SK
(TC)	-	Times-Colonist, Victoria, BC
(CTV)	-	CTV News Online
(SLRB)	-	St. Lawrence River Board of Control, Ottawa, ON
(TTWS04)	-	Top Ten Weather Stories of 2004, MSC

Information that is categorized by date is the summary information gleaned from newspapers published on that date.

Storm Summary Information

More detail is available on storms after 1995

Researchers

Peter Bowyer - project manager; overall editor; sundry meteorological and anecdotal data gathering

Jonathan Button - newspaper and storm track summaries 1900-2004; shipwreck database

Craig Clarke - meteorological summary information: 1995-2001

Rebecca Hanson - Hurricane Hazel research; newspaper and storm track summaries 1900-2002; overall newspaper editing

Lorne Ketch - consultant. document layout, formatting and final preparation.

Jill Maepea - newspaper and storm track summaries 1900-2003; shipwreck database

Cara Nickerson - newspaper and storm track summaries 1900-2002

ATTRIBUTE DATA SEARCH METHODOLOGY

One objective of the Canadian Hurricane Centre Climatology Project was to compile Canadian hurricane related damage and mortality statistics allowing the information to be included in this report, but also available to the public through the CHC website and personal communication with the centre's staff. Four broad sources were consulted, one more extensively than others. Sources include newspapers, the internet, and other organizations.

Newspapers

Newspapers provide very detailed real time accounts of the impact of a storm; therefore they are the most useful source. Monetary damage estimates cited in newspaper articles immediately following a storm may be misleading due to incomplete damage reports, failure to include an entire region, or failure to specify what statistics are included. Revisions of these storm costs may be neglected in future editions. Often a newspaper will fail to update stories reported in previous editions overlooking revisions on a storm's impacts. One example witnessed were reports that a person had gone missing in a storm, but with no further information. In these situations missing persons cannot be added to a death toll for a storm as it is unknown whether the person actually perished.

Time constraints in the newspaper search necessitated the narrowing of the search criteria at the risk of missing extra statistics. For each of the six eastern provinces that have had to cope with hurricanes the largest newspaper was chosen to be the primary reference as it was not feasible to consult more than one publication in each province, except as noted below. The newspapers consulted were the *Chronicle Herald* (Halifax, NS), *Telegraph Journal* (Saint John, NB), the *Guardian* (Charlottetown, PEI), the *Evening Telegram* (St. John's, NFLD), the *Gazette* (Montreal, Que), the *Toronto Star* (Toronto, Ont), and the *Globe and Mail* (Toronto, Ont).

All tropical cyclones were analyzed to determine if they would likely have affected Canadian land or people. Dates that storms might have impacted Canada were recorded and organized by province. Often, several provincial newspapers were consulted for a single storm because of the far-reaching effects of a hurricane. The newspaper was consulted from the date the storm entered the response zone to one week after the storm had passed or until articles ceased being published on a storm. With more time the search period would have been extended to attempt to gather more storm details, such as insurance statistics, that often take longer to calculate. The Toronto Star allowed a more complete search as the archive was digitized allowing a keyword search to be conducted.

Most of the newspapers were investigated at the National Library in Ottawa except the *Chronicle Herald* and the *Toronto Star*, which were investigated in Halifax, at the Nova Scotia Archives, the Halifax Regional Library, and from the online *Toronto Star* database. All articles located were printed and filed according to year. These articles will be retained by the Canadian Hurricane Centre for any future reference.

Internet

An extensive internet literature search was also conducted for additional information, although many of the statistics that the search yielded were not referenced and therefore deemed less reliable. Several valuable sources were discovered and the details were printed and added to the newspaper files. For example, Public Safety and Emergency Preparedness Canada, maintains a disaster database with damage and death statistics related to any natural or human induced event. Also, a website titled *Lost at Sea* contained many applicable reports of deaths due to tropical cyclones as recorded from smaller east coast publications.

Shipwreck Methodology

The Hurricane Climatology Project included significant research into shipwrecks along the Atlantic Coast of Canada. This region has been home to a large scale fishing industry, major shipping routes, and an avenue for immigration from European Countries over the past couple of centuries. When unexpected tropical cyclones moved into the region, many of these vessels fled for safety. Unfortunately, many lives still have been lost as a result of these storms.

Valuable sources of shipwreck data are available throughout different locations in Nova Scotia. These include: the *Maritime Museum of the Atlantic* in Halifax, the *Fisheries Museum of the Atlantic* in Lunenburg, the *Halifax Regional Library*, and the *Dalhousie Killam Memorial Library* in Halifax. Shipwreck data was obtained from the major newspapers that were collected for other components of the climatology project and from a variety of shipwreck reference books composed by several authors within the Atlantic Provinces. Also incorporated were several archives such as the Northern Shipwreck Database CD obtained from the Halifax Regional Library, an information kiosk station at the Maritime Museum of the Atlantic, and a previously compiled shipwreck database at the Maritime Museum of the Atlantic.

These sources of information were investigated at their respective locations within the Halifax region and relevant information was either printed or recorded and filed by year. A list of reference books containing substantial information was recorded and copies of each text have been placed in Environment Canada's Library located in Dartmouth, Nova

Scotia. To avoid research duplication in future years a database of **ALL** reviewed sources has been created, with annotations noting the data's relevance to this project.

All vessels which were found to have been affected by a tropical cyclone were compiled within a spreadsheet database. Shipwreck fatalities were considered to be any death within Atlantic Canada's and the Great Lakes marine forecast areas. For all notable shipwrecks, the date, location, and number of fatalities were recorded, as well as the vessel name, reference source, and comments concerning the vessel. The spreadsheet was organized by year and storm date and sorted alphabetically by vessel name. Note that the nationality of the vessel or of lost persons was not deemed significant to this project.

Listed here are some significant obstacles frequently encountered in the research:

1. The number of fatalities was unknown or several sources reported different values; this discrepancy was noted and a range of fatalities was recorded.
2. Vessels that were lost were reported without any indication of their exact location.
3. Vessels were reported missing but no further indication of status was given (i.e. it is unknown if the vessel returned safely or was subsequently confirmed to be lost). This became a major issue in the 1900 Galveston Hurricane. The range of fatality statistics therefore incorporates people which are classified as "missing." The lower number within a range is a confirmed number of fatalities. The higher number includes the confirmed fatalities plus the additional missing and other unconfirmed fatalities (confirmed fatalities would be best defined as a report, whether it be a newspaper or reference book stating that a vessel was lost with a known number of crewmembers, with no contradictory articles being found).
4. Some databases were organized only by vessel name and had no information of the shipwreck date. This frustrated the research, making extremely difficult the determination as to whether or not the vessel was lost by a tropical cyclone (in many cases the determination was impossible).
5. Misspelling of vessel names created ambiguity. Several cases were found where vessels were given different spellings of their names; however, further study confirmed the ships were the same. In such cases both names were given.
6. Ambiguity also arose due to the discrepancy between shipwreck dates based on meteorological data and data cited in the literature. In several instances, a shipwreck was reported to have been due to a hurricane on a given date, however, meteorological data (such as reliable track maps) show that the storm likely did not affect the area until the following day. Sometimes the loss of a vessel and the passage of the tropical cyclone may have been out of phase by as much as two days. Despite this, these vessels were recorded and noted that the date of wreckage may be incorrect.
7. Much of the information gathered at the Maritime Museum of the Atlantic and other sources focussed on vessels registered in Nova Scotia or those lost in Nova

Scotian waters. Few reference books covered the other Atlantic Provinces in similar detail.

Other sources

The final sources consulted within this phase of the investigation were other organizations that have infrastructure to cope with hurricanes. For example Search and Rescue maintains a database including statistics on operations they have participated in, such as hurricanes. The Red Cross is another potential source that may be consulted as the organization is normally the first non-governmental agency to respond to recovery efforts and the Institute for Catastrophic Loss Reduction specializes in research that lessens the cost of natural hazards.

CANADIAN FATALITIES

Canadian fatalities are any fatalities occurring in Canada or her territorial waters.

Table: Chronological Listing of Canadian Tropical Cyclone Related Fatalities Since 1899

The lower number in a range is the number of confirmed deaths.
The upper number is the total of confirmed and unconfirmed deaths.

Year	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Total Confirmed	Total Unconfirmed	Total Confirmed & Unconfirmed
1900	1 (#1)		1 (#5)				51(#1)		180 (#1)	53	180	233
1901							3 (#6)			3		3
1902												
1903												
1904				1 (#2)						1		1
1905												
1906												
1907												
1908							8 (#2)			8		8
1909												
1910							1 (#4)			1		1
1911												
1912												
1913												
1914												
1915	5 (#1)									5		5
1916							12 (#10)		7 (#10)	12	7	19
1917												
1918							21(#4)			21		21

Year	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Total Confirmed	Total Unconfirmed	Total Confirmed & Unconfirmed
1919												
1920												
1921												
1922												
1923						1 (#2)	1 (#2)		7 (#2)	2	7	9
1924							26 (#2) 2 (#3)		10 (#3)	28	10	38
1925												
1926							55 (#2)		3 (#2)	55	3	58
1927				1 (#1)		1(#1)	171 (#1)		19 (#1)	173	19	192
1928												
1929												
1930												
1931												
1932							14 (#4) 1(#5)		1 (#4) 8 (#5)	15	9	24
1933							1 (#13) 9 (#18)			10		10
1934												
1935							34 (#1) 1 (#4)		15 (#1)	35	15	50
1936				1(#13)			4 (#13)		1 (#13)	5	1	6
1937												
1938	1 (#4)						4 (#7)			5		5
1939							6 (#4)			6		6
1940								1(#5)			1	1
1941	3 (#2)									3		3
1942												
1943												
1944				1 (#7)						1		1
1945												
1946												
1947												
1948						1 (#6)	1 (#6)			2		2
1949		3 (#2)								3		3
1950				2 (Able)					12 (Dog)	2	12	14
1951												
1952												

Year	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Total Confirmed	Total Unconfirmed	Total Confirmed & Unconfirmed
1953							2 (Barbara) 1 (Carol) 1 (NN 3)		1 (NN3)	4	1	5
1954	81 (Hazel)			1 (Edna)						82		82
1955	1 (Connie)						2 (Connie)			3		3
1956												
1957	5 (Audrey)	10 (Audrey)								15		15
1958												
1959							35 (NN1)			35		35
1960		1 (Donna)								1		1
1961												
1962				6 (Daisy)						6		6
1963												
1964												
1965												
1966												
1967												
1968				1 (Gladys)	1 (Gladys)					2		2
1969												
1970												
1971				1 (Beth)						1		1
1972												
1973												
1974												
1975												
1976	1 (ST 2)									1		1
1977												
1978												
1979												
1980												
1981												
1982												
1983												
1984									1 (Diana)		1	1
1985												
1986						1 (Charley)				1		1
1987												
1988												

Year	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Total Confirmed	Total Unconfirmed	Total Confirmed & Unconfirmed
1989				1 (Gabrielle)						1		1
1990												
1991				2 (Bob)		1(Unnamed)	6(Unnamed)			9		9
1992												
1993												
1994												
1995						1 (Luis)				1		1
1996												
1997												
1998												
1999												
2000												
2001												
2002					1 (Gustav)		1 (Arthur)			2		2
2003	1 (Isabel)			6 (Juan)			2 (Juan)			9		9
2004			1 (Bonnie)			4 (Ivan)	2 (Ivan)			7		7
Total	**99**	**14**	**2**	**24**	**2**	**10**	**478-494**	**1**	**265**	**629**	**266**	**895**

Table: Canadian Tropical Cyclone Related Fatalities since 1899 – Sorted by Year

Year	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Total Confirmed	Total Unconfirmed	Total Confirmed & Unconfirmed
1900	1		1				51		180	53	180	233
1901							3			3		3
1904				1						1		1
1908							8			8		8
1910							1			1		1
1915	5									5		5
1916							12		7	12	7	19
1918							21			21		21
1923						1	1		7	2	7	9
1924							28		10	28	10	38
1926							55		3	55	3	58
1927				1		1	171		19	173	19	192
1932							15		9	15	9	24
1933							10			10		10
1935							35		15	35	15	50
1936				1			4		1	5	1	6
1938	1						4			5		5
1939							6			6		6
1940								1			1	1
1941	3									3		3
1944				1						1		1
1948						1	1			2		2
1949		3								3		3
1950				2					12	2	12	14
1953							4		1	4	1	5
1954	81			1						82		82
1955	1						2			3		3
1957	5	10								15		15
1959							35			35		35
1960		1								1		1
1962				6						6		6

Year	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Total Confirmed	Total Unconfirmed	Total Confirmed & Unconfirmed
1968				1	1					2		2
1971				1						1		1
1976	1									1		1
1984									1		1	1
1986						1				1		1
1989				1						1		1
1991				2		1	6			9		9
1995						1				1		1
2002					1		1			2		2
2003	1			6			2			9		9
2004			1			4	2			7		7
Total	99	14	1	24	2	10	478-494	1	265	629	266	895

Table: Canadian Tropical Cyclone Related Fatalities since 1899 – Sorted by Storm

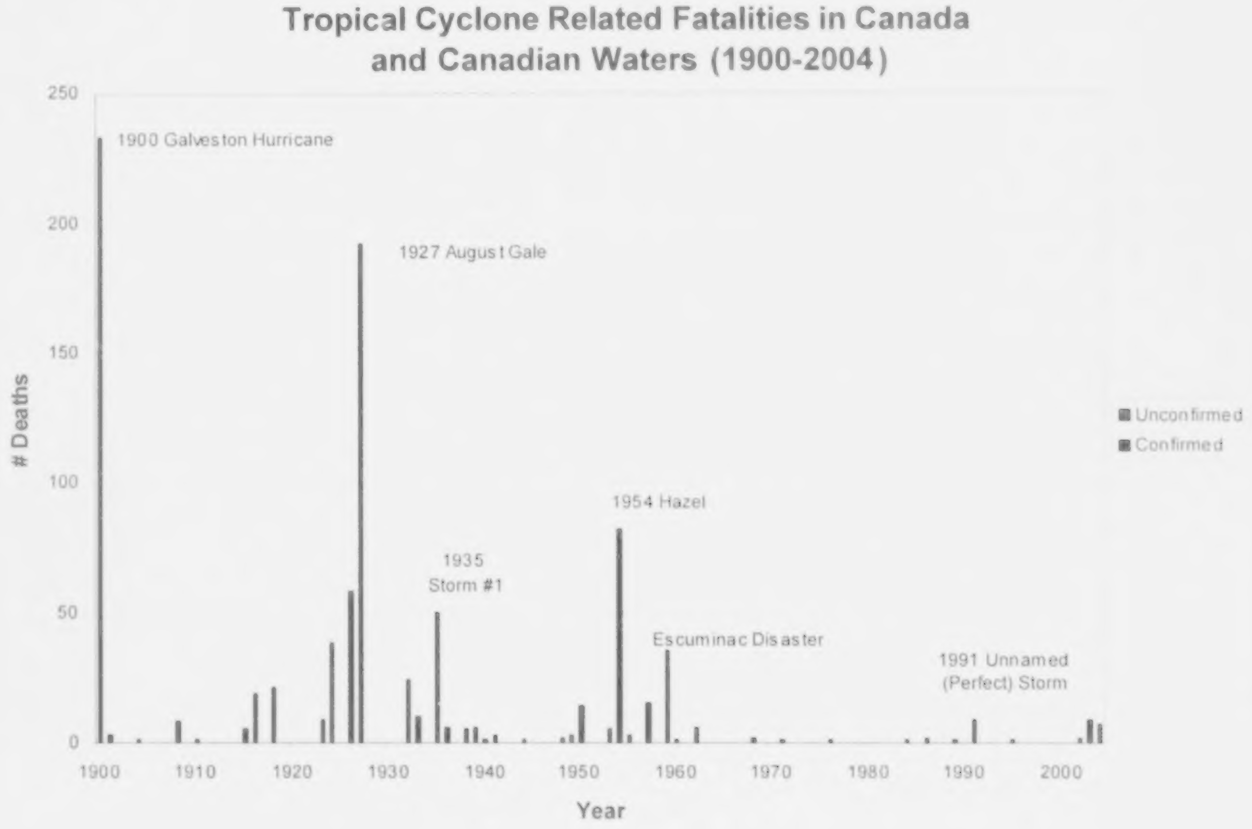
Storm	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Confirmed	Unconfirmed	Confirmed + Unconfirmed
1900-1	1		1				51		180	53	180	233
1927-1				1		1	171		19	173	19	192
1954-Hazel	81									81		81
1926-2							55		3	55	3	58
1935-1							34		15	34	15	49
1959-NN1							35			35		35
1924-2							26			26		26
1918-4							21			21		21
1916-10							12		7	12	7	19
1957-Audrey	5	10								15		15
1932-4							14		1	14	1	15
1924-3							2		10	2	10	12
1950-Dog									12		12	12
1933-18							9			9		9
1923-2						1	1		7	2	7	9
1932-5							1		8	1	8	9
1908-2							8			8		8
2003-Juan				6			2			8		8
1991-Unnamed						1	6			7		7
1939-4							6			6		6
1962-Daisy				6						6		6
2004-Ivan						4	2			6		6
1936-13				1			4		1	5	1	6
1915-1	5									5		5
1938-7							4			4		4
1901-6							3			3		3
1941-2	3									3		3
1949-2		3								3		3
1955-Connie	1						2			3		3
1948-6						1	1			2		2
1950-Able				2						2		2

Storm	ON	QC	NB	NS	PE	NL	Marine	Public Missing or Unconfirmed	Marine Missing or Unconfirmed	Confirmed	Unconfirmed	Confirmed + Unconfirmed
1953-Barbara							2			2		2
1968-Gladys				1	1					2		2
1991-Bob				2						2		2
1953-NN3							1		1	1	1	2
1904-2				1						1		1
1910-4							1			1		1
1933-13							1			1		1
1935-4							1			1		1
1938-4	1									1		1
1944-7				1						1		1
1953-Carol							1			1		1
1954-Edna				1						1		1
1960-Donna		1								1		1
1971-Beth				1						1		1
1976-St2	1									1		1
1986-Charley						1				1		1
1989-Gabrielle				1						1		1
1995-Luis						1				1		1
2002-Arthur							1			1		1
2002-Gustav					1					1		1
2003-Isabel	1									1		1
2004-Bonnie			1							1		1
1940-5								1			1	1
1984-Diana									1		1	1
Total	99	14	2	24	2	10	478	1	265	629	266	895

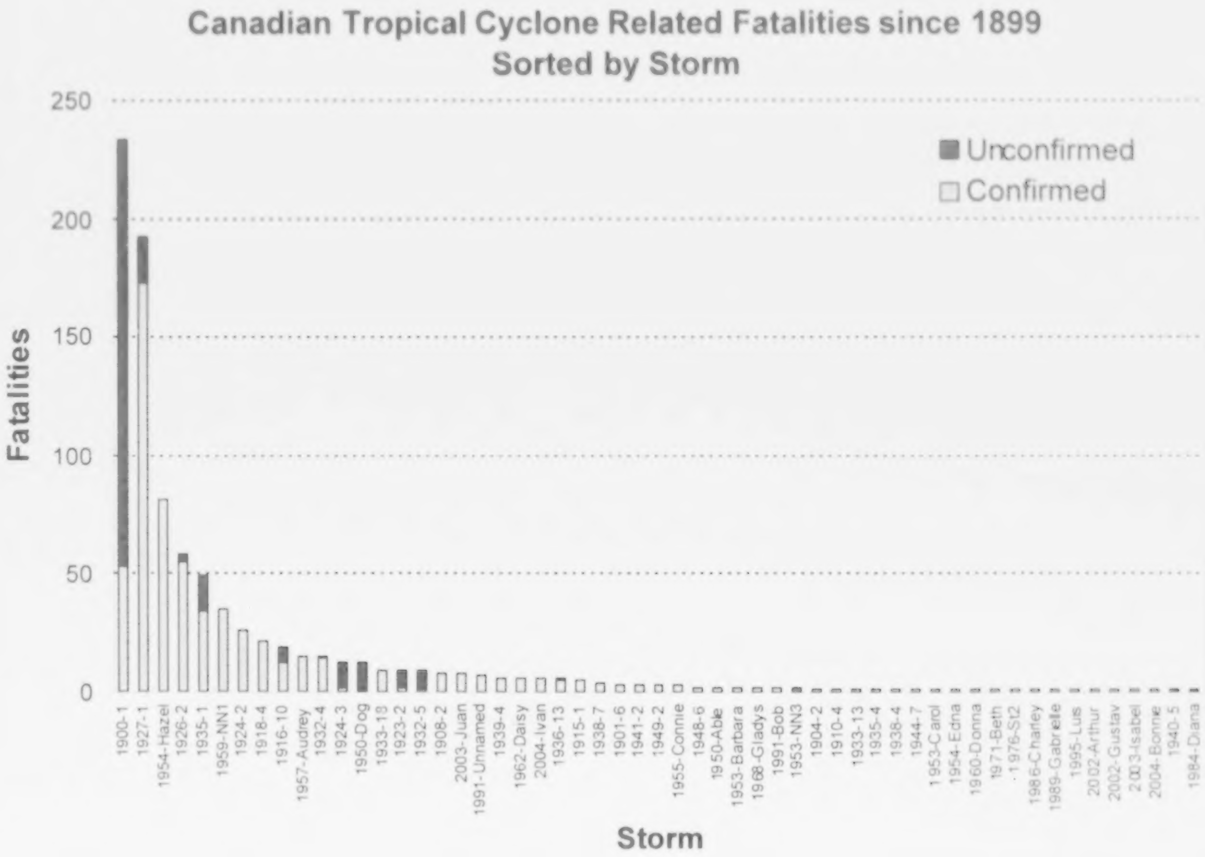
Table: Details of Inland Deaths Since 1950

Year	Storm	Province	#	Details
2004	Ivan	NF	4	Four lives were lost in traffic accidents across Newfoundland as weather conditions deteriorated road conditions.
2004	Bonnie	NB	1	A Quebec man was killed when his vehicle overturned while attempting to cross a stream in Baker Brook near Edmundston.
2003	Juan	NS	1	Tree fell on occupied motor vehicle
2003	Juan	NS	1	Tree fell on occupied ambulance - paramedic involved in rescue operations
2003	Juan	NS	3	House fire set by misuse of candles during power outages in the days following hurricane
2003	Juan	NS	1	Man died from heart-attack during relief / cleanup operation a couple weeks after hurricane
2003	Isabel	ON	1	A woman passenger was killed on County Road 4 when a truck lost control north of Odessa due to wet road conditions
2002	Gustav	PE	1	Motor vehicle accident during heavy rain / wind
1995	Luis	NF	1	Man struck by a couple of cars while crossing street during poor visibility of storm conditions
1991	Bob	NS	2	Teens drowned when swept from shore by waves
1991	Unnamed	NF	1	Storm caused slippery roads on the Trans Canada near Grand Falls-Windsor which resulted in a car accident killing one man
1989	Gabrielle	NS	1	Man drowned when swept from shore by waves
1986	Charley	NF	1	Search and Rescue combed water, but to no avail, looking for 17 year old that was swept off the rocks in St. John's
1976	SubTrop2	ON	1	Storm-induced motorcycle accident
1971	Beth	NS	1	Storm-induced car accident
1968	Gladys	NS	1	Man drowned
1968	Gladys	PE	1	Tree fell on man in truck
1962	Daisy	NS	6	All drowned when swept into water by waves at shore (Peggy's Cove)
1960	Donna	QC	1	Man died from heart-attack when flames from a fire caused by high winds threatened his home
1957	Audrey	ON	1	Child drowned in raging flood water
1957	Audrey	ON	3	3 died in 2 separate storm-induced car accidents
1957	Audrey	ON	1	Firefighter died during rescue work
1957	Audrey	QC	9	During multiple storm-induced automobile accidents
1957	Audrey	QC	1	Unknown cause
1955	Connie	ON	1	Man drowned when swept into lake
1954	Hazel	ON	81	Mostly drownings
1954	Edna	NS	1	Man died when barn collapsed
1950	Able	NS	2	2 children died when their raft overturned (raft used to escape flood waters - not a marine incident)

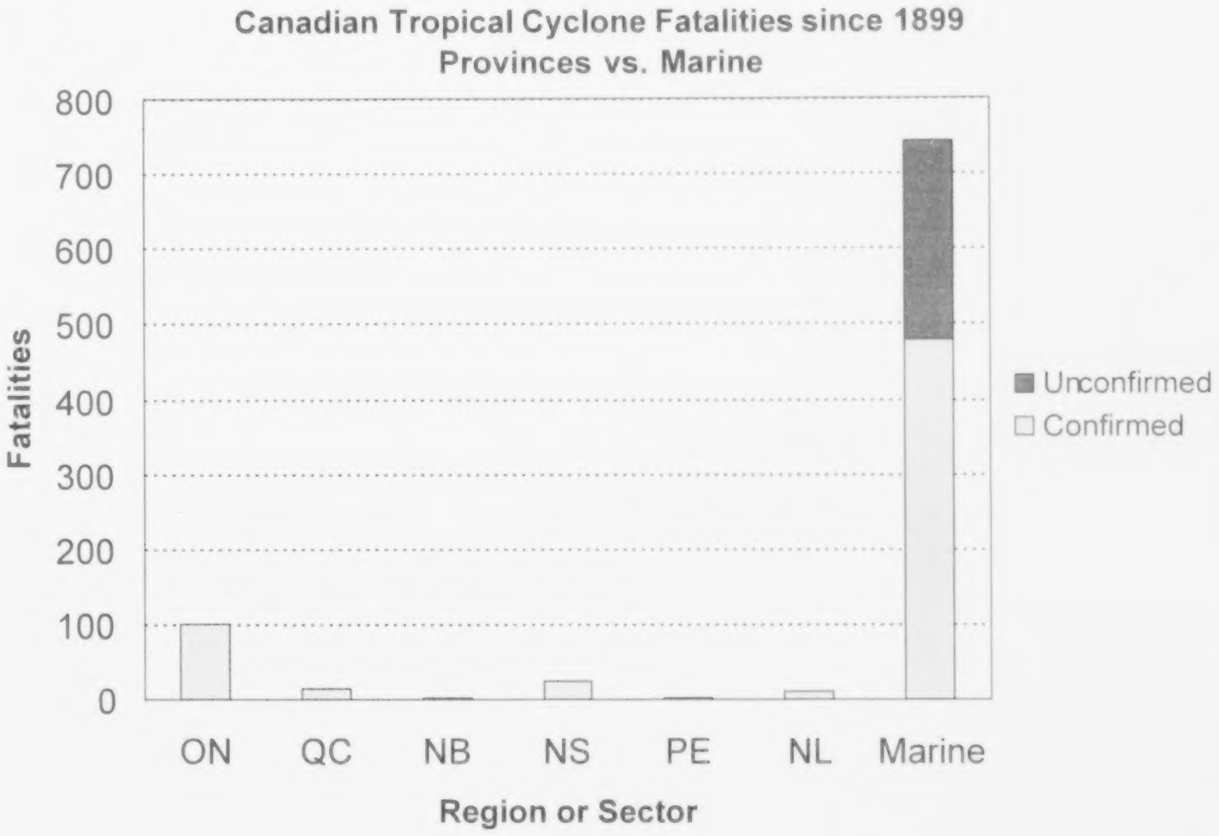
Graph: Tropical Cyclone Related Fatalities in Canada and Canadian Waters (1900-2004)


Tropical Cyclone Related Fatalities in Canada and Canadian Waters (1900-2004)

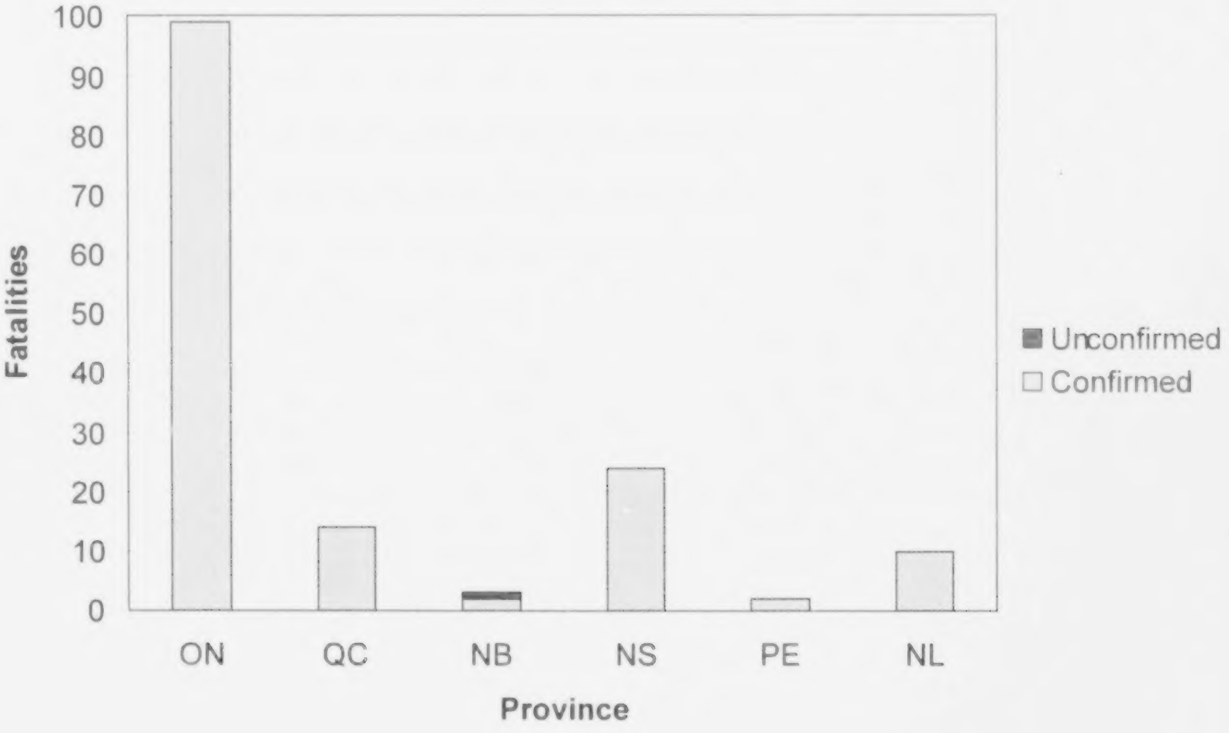
Graph: Canadian Tropical Cyclone Related Fatalities since 1899 – Sorted by Storm



Graph: Canadian Tropical Cyclone Fatalities since 1899 – Provinces vs. Marine

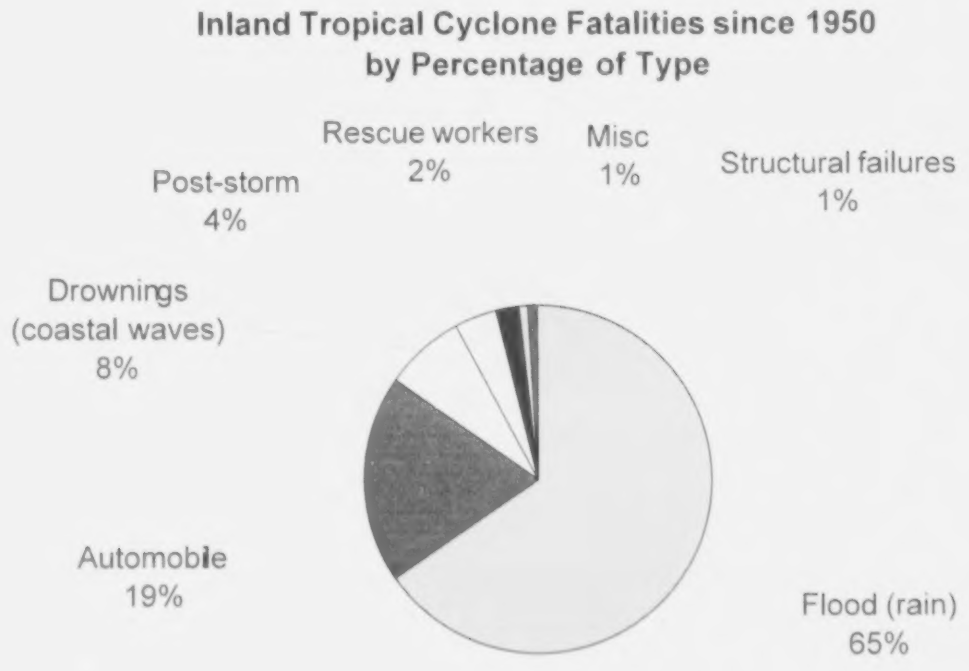


Graph: Canadian Tropical Cyclone Fatalities since 1899 Sorted by Provinces


Canadian Tropical Cyclone Fatalities since 1899
Sorted by Provinces

7

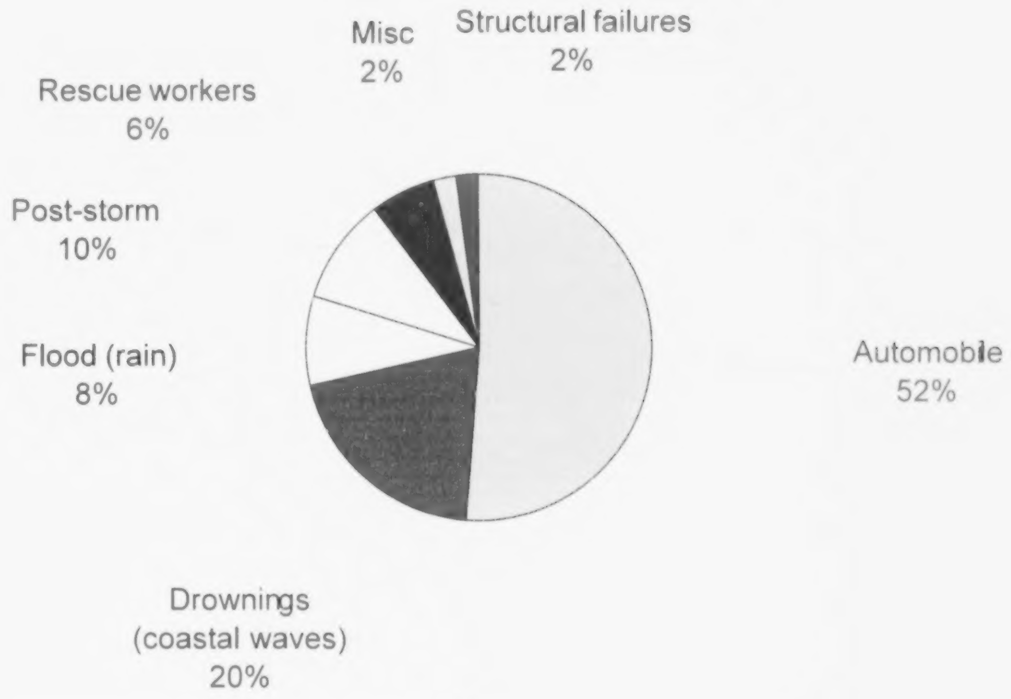
Graph: Inland Tropical Cyclone Fatalities since 1950 by Percentage of Type



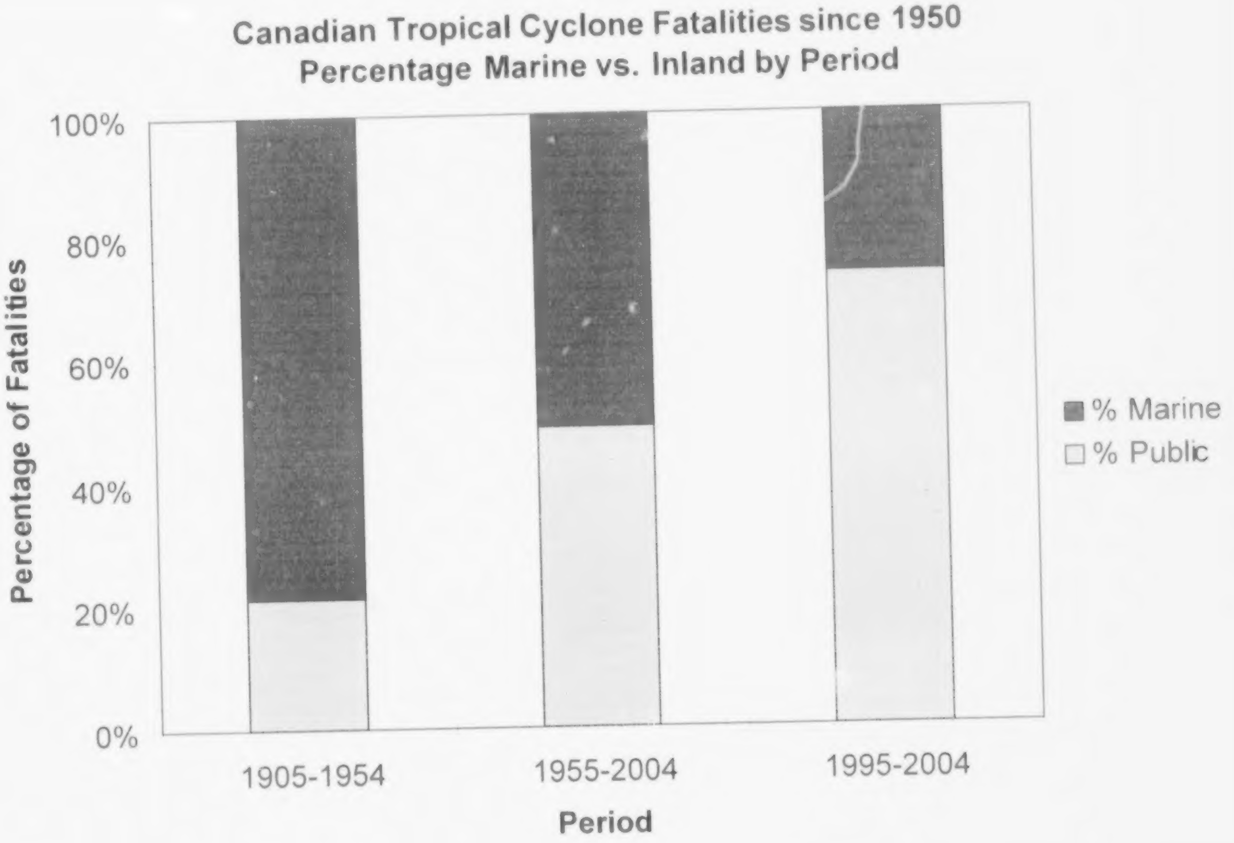
Inland Tropical Cyclone Fatalities since 1950 by Percentage of Type

Graph: Inland Tropical Cyclone Fatalities since 1950 (without Hazel) by Percentage of Type

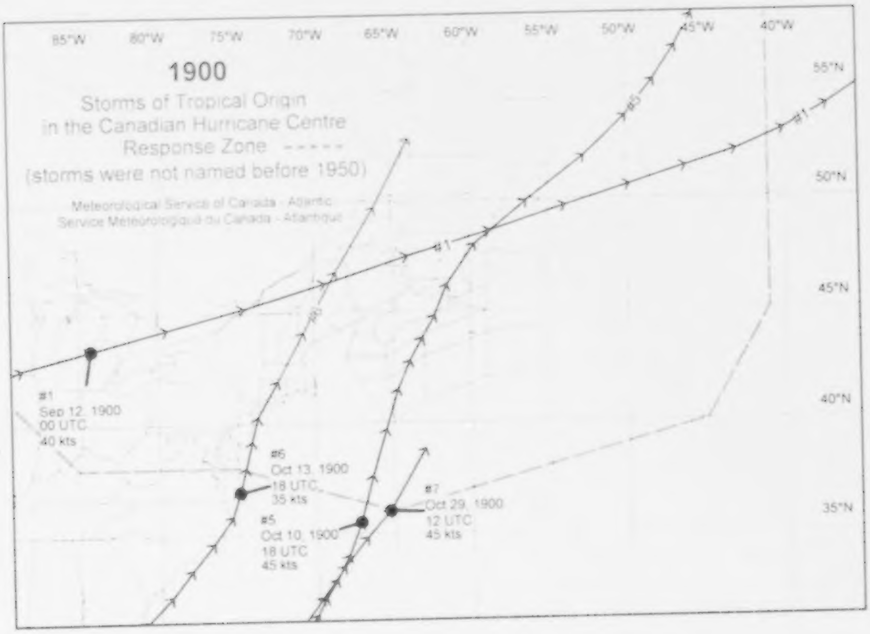
Inland Tropical Cyclone Fatalities since 1950 (without Hazel) by Percentage of Type



Graph: Canadian Tropical Cyclone Fatalities since 1950 Percentage Marine vs. Inland by Period



1900 – MAP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1900
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#1
#5
#6
#1
Sep 12, 1900
00 UTC
40 kts
#6
Oct 13, 1900
18 UTC
35 kts
#5
Oct 10, 1900
18 UTC
45 kts
#7
Oct 29, 1900
12 UTC
45 kts

1900–1 (“The Galveston Hurricane”) † (52–232 Canadian fatalities)

Storm # 1 made landfall in Ontario as a tropical storm of 74 km/h (40 knots).

This storm, also known as the Galveston Hurricane because of the widespread disaster it wrought on the coastal Texas town, formed on August 27, 1900 in the Atlantic Ocean off the Cape Verde Islands. After the storm's landfall in Texas, it tracked northwards through the American Midwest, entered the CHC Response Zone on September 11th, and hit Canada on September 12th east of Port Albert, Ontario. The storm crossed southern Ontario, the Gaspe Peninsula of Quebec, New Brunswick, and Newfoundland before exiting the CHC Response Zone on September 14th. Maximum wind speeds for this storm were 213 km/h (115 knots), while the maximum in the CHC Response Zone was 83 km/h (45 knots) and 74 km/h (40 knots) at landfall in Ontario.

The Galveston hurricane was responsible for **52–232 deaths in Canada**, mostly due to damage sustained by fishing and shipping vessels off Newfoundland and Prince Edward Island. The large discrepancy between confirmed and unconfirmed deaths is almost entirely in the numbers of missing people from St. Pierre. Crop damage amounting to an estimated *$1 million* was experienced in Ontario. New Brunswick, Prince Edward Island and Nova Scotia had to cope with wind and rain damage to crops and structures.

- 107 people were lost on 8 boats at St. Pierre, France (GGHC)

September 13, 1900

- The *Ali Baba* was lost at St. Pierre, France with 13 crew onboard (GGHC)

ONTARIO

- Ottawa–winds 48 km/h (26 knots) (GGHC)
- Recorded rainfall amounts–Bruce Mines 58 mm (2.3 in), Parry Sound 53 mm (2.1 in), Emsdale 54 mm (2.1 in), Huntsville 39 mm (1.5 in), Uplands 73 mm (2.9 in), and Haileybury 78 mm (3.0 in) (GGHC)
- Windows smashed throughout Toronto (GGHC)
- Crop damage estimated at *$1 million* (GGHC)

September 12, 1900

- Toronto–winds 80–125 km/h (43–67 knots) (TS, MTB)
- Georgian Bay–25–75 mm (1–3 in) of rain (TS)
- Swells on the lake reported as 2.4–3.0 m (8–10 ft) higher than normal (TS)
- Falling trees knocked down telegraph, telephone and electric lines (TS)
- Paris–*$350,000* damage to a flour mill and 50 other stores and offices when gale winds fanned a fire that broke out in the mill. The cause of the fire was unknown (TJ,TS)
- High winds battered many boats along the lake shore–several boats driven ashore, others destroyed, and several set adrift (TS)
- St. Catharines–peach, pear, plum, and apple orchards severely damaged by the wind, fruit lost and trees suffered broken limbs (TS)
- Sailing vessels forced to delay or cancel departures (TS)

September 13, 1900

- Niagara Falls–one man dead–he was swept into the river as he attempted to clear debris from a pumping station (TS)
- Schooner *Albacore* from Toronto grounded and badly damaged (TS)
- Owen Sound–schooner *Mary Everett* grounded on rocks–badly damaged (TS)

QUEBEC

- Rainfall–Ste. Agathe 36 mm (1.4 in), Quebec City 59 mm (2.3 in), Bic 74 mm (2.9 in), Perce 100 mm (3.9 in), and Chicoutimi 28 mm (1.1 in) (GGHC)

NEW BRUNSWICK

- Rainfall–Bathurst 64 mm (2.5 in), Chatham 35 mm (1.4 in), and Fredericton 30 mm (1.2 in) (GGHC)

September 13, 1900

- Saint John–77 km/h (42 knots) wind (TJ)

September 14, 1900

- Gloucester County–schooner *Carita* ashore (TJ)
- Courtenay Bay–barque–*Ingomar* ashore (TJ)

PRINCE EDWARD ISLAND

September 14, 1900

- Cascumpec Harbour–schooner *Reality* ashore cargo of salt and lumber lost and four crew drown (G)
- Tignish–two fishing boats, *Japan* and *Midnight* were ashore and the crews are believed lost (G)
- Nail Pond–schooner grounded ashore–crew presumed lost (G)
- Approximately 40 wires knocked down by falling trees (G)
- Fruit crops blown from trees (G)
- St. George–a barn was destroyed by the wind (G)
- Hillsborough Square–house damaged when chimney blown down and crashes through roof (G)
- St. Peter's Bay–bridge & wharf damaged (G)
- Seacow Head–lobster factory destroyed (G)
- North Carleton–600 lobster traps washed away by tide and destroyed–three boats driven ashore and one badly damaged (G)
- Wilmot–a barn and windmill destroyed by the wind (G)

September 15, 1900

- Boxcar blown off the railway tracks (TJ)

NOVA SCOTIA

September 13, 1900

- Halifax–damage included fences leveled, grass broken, trees uprooted, house under repair blown over by winds, boats battered against docks and exhibition ride blown over and badly damaged (HH)

September 14, 1900

- Sydney–two schooners ashore–*Tiletus & Grenada* (HH)

September 17, 1900

- The schooner *Greta* from Dorchester, New Brunswick was capsized off Low Point, Cape Breton. The fate of the crew is unknown (TJ)
- The brigantine *Clyde* from Barbados was driven ashore at Broad Cove, Cape Breton. It is a total loss (TJ)

NEWFOUNDLAND

- Rainfall–Point Riche had 86 mm (3.4 in), Point Amour had 70 mm (2.8 in), St. John's had 43 mm (1.7 in) (GGHC)

September 13, 1900

- The *Goodwill* was wrecked at White Island with five crew lost (NSD)
- 96 km/h (52 knots) wind in St. John's (HH)
- An outdoor exhibition had to delay its opening due to the storm (HH)

September 15, 1900

- Several fishing vessels destroyed & many schooners beached (HH)

September 17, 1900

- Trepassey–one man died when he was swept from the deck of the schooner *J.O. Fraser* (ET)
- One man swept off fishing vessel and drowned off Cape Shore (ET)
- Codroy–schooners *Florrie M.* and *Pearl* were damaged when they were driven ashore by the storm (ET)
- St. Jacques–schooner ashore (ET)
- Schooner *Mary Hendry* disabled 16 km (10 mi) off Cape St. Mary's (ET)

September 18, 1900

- Schooner *Willie A. Mackay* sinks on Grand Banks–one crew member lost (ET)

September 22, 1900

- The *Grace Darling* was lost in Fortune Bay with two crew (ET)

September 24, 1900

- The French banker vessel *Thorney* foundered on the Grand Banks. 14 crewmembers were lost and six were saved (TJ)
- The schooner *Fiona* was lost at LaPoile with at least two crewmembers (another report states that all crewmembers were lost on October 15, 1900) (ET)

- The schooner *Eddie* lost three crew during the gale (TJ)
- The schooner *Dolphin* was damaged and three crewmembers were lost (TJ)
- The schooner *Kestrel* was damaged during the storm and began to leak. It later sank but the crew saved (TJ)

September 26, 1900

- The schooner *Tugela* lost with two crew (ET)

1900–5 † (1 Canadian fatality)

Storm # 5 made landfall on the Eastern Shore of Nova Scotia early on October 12th as an extratropical storm of 74 km/h (40 knots).

This storm formed on October 4, 1900 east of the Caribbean Islands in the Atlantic Ocean. Storm 5 curved westward before turning to the northeast and entering the CHC Response Zone on October 10th. The storm made landfall in Guysborough County, Nova Scotia on October 12th. After striking Nova Scotia, the storm crossed Newfoundland before dissipating off the tip of Greenland on October 14th. The storm only reached tropical storm strength with 111 km/h (60 knots) winds, and had weakened to an extratropical storm of 74 km/h (40 knots) by the time it made landfall on the Eastern Shore of Nova Scotia early on October 12th. **One death was attributed to the storm in Canada, where a child who was trying to cross a swollen creek drowned.** The storm caused flooding in southern New Brunswick disrupting rail service; plus damage in Nova Scotia and Prince Edward Island, including downed telephone, telegraph, and electricity lines and wind damage to structures.

NOVA SCOTIA

October 15, 1900

- Point Aconi–barque *Ole Smith Ploug* ashore (TJ)
- 13 schooners grounded and two destroyed (TJ)
- In the east end of the province telegraph lines fell due to the storm (HH)
- Train derailed as wind blew a switch opening one side of the tracks (HH)
- Bayfield–the roofs of barns removed and trees uprooted (HH)

NEW BRUNSWICK

October 12, 1900

- Saint John–corner of Albert and Victoria Streets under approximately 30 cm (1 ft) of water, Shamrock grounds submerged, Corkery marsh flooded with water, Main street at Paradise Row submerged, house on Paradise Row flooded with 45 cm (18 in) of water, and Victoria Rink flooded (TJ)
- Saint John–High tide caused flooding that submerged parts of the city around Haymarket Square, City Road, and Gilbert's Lane (TJ)
- Hen house floated off its foundation into middle of creek (TJ)
- Sackville–marshes flooded–low roads submerged–bridges destroyed (TJ)
- River level rose–expected to impact hay crop yield (TJ)
- Service on the Shore Line railway disrupted (TJ)
- Washouts on the Canadian Pacific Railway line between Fredericton and Saint John–each 30.4 m (100 ft) long and approximately 7.6 m (25 ft) deep (TJ)
- 25 washouts between Fairville and Vanceboro–10 washouts between Fredericton Junction and McAdam (TJ)

October 13, 1900

- Child drowned trying to cross swollen creek (TJ)
- Highway bridges damaged or destroyed (TJ)
- Chatham–ship grounded–windows broken by flying debris (TJ)

October 15, 1900

- Canadian Pacific Railway–estimated cost *$100,000* to replace the main line and branches that were damaged (MG)

PRINCE EDWARD ISLAND

October 12, 1900

- Damage from the storm included fallen telephone and electrical wires, shingles torn off roofs, shutters pulled from windows, chimneys knocked over, and windows broken (G)

October 13, 1900

- Houses were damaged when chimneys blown over by the storm smashed into them (G)
- Small buildings on properties blown down (G)
- Electrical lines down in Charlottetown (G)
- McLaughlin's Bridge washed out (G)

1900–6

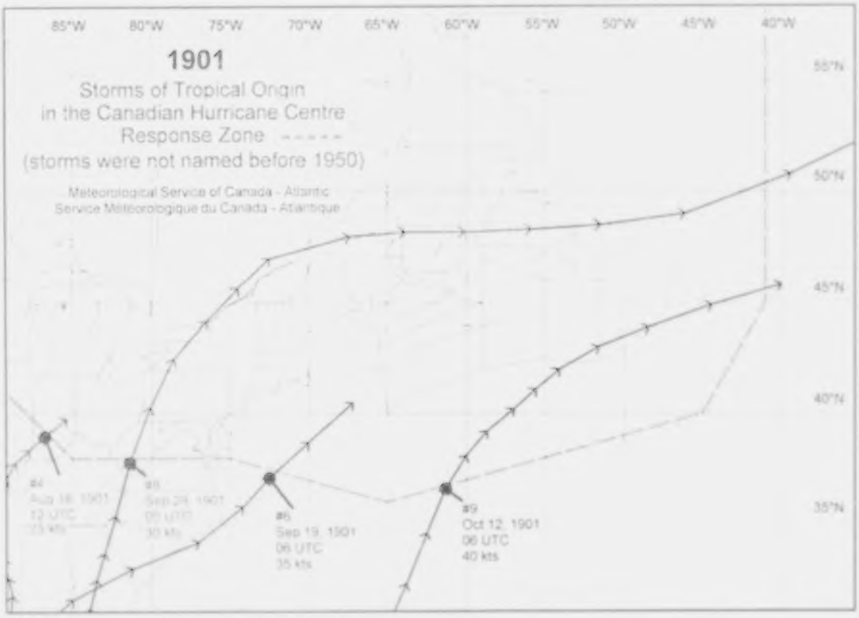
Storm # 6 made landfall in northern New Brunswick late on October 14th as a tropical depression of 56 km/h (30 knots).

Storm #6 formed on October 8, 1900 in the Caribbean Ocean east of Belize. The storm tracked northward over the Mexican Yucatan Peninsula, then turned to the east, tracking across Florida and turning to the northeast. After tracking over North Carolina, the storm entered the CHC Response Zone on October 13th and entered Canadian territory late on October 14th in northern New Brunswick as a tropical depression of 56 km/h (30 knots). The storm passed over the Gaspe Peninsula and southeast Quebec before dissipating over Labrador on October 15th. No damage statistics were located for this storm.

1900–7

Storm #7 formed east of the Caribbean Islands in the Atlantic Ocean on October 23, 1900 and then tracked generally northward over the islands. The storm entered the CHC Response Zone south of Nova Scotia on October 29th as a tropical storm of 80 km/h (43 knots) and dissipated later that day before it crossed Canadian territory. No damage statistics were located for this storm.

1901 – MAP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1901
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#4
Aug 18, 1901
12 UTC
25 kts
#8
Sep 29, 1901
00 UTC
30 kts
#6
Sep 19, 1901
06 UTC
35 kts
#9
Oct 12, 1901
06 UTC
40 kts

1901–4

Storm #4 formed in the mid-Atlantic Ocean far east of the Florida coast on August 4, 1901. This storm developed into a category two hurricane and contained winds as high as 157 km/h (85 knots). The storm moved inland through the United States and entered the CHC Response Zone on August 18th while weakening into a tropical depression, and diminished later that day. It affected Ontario, bringing winds of 46 km/h (25 knots). The storm killed several horses and damaged property.

ONTARIO

August 20, 1901

- A man's barn was struck by lightning and a team of horses was killed outside Toronto. Damage was $3,000 (TS)

1901–6 † (3 Canadian fatalities)

Storm #6 originated east-northeast of the Lesser Antilles on September 9, 1901 and contained winds of 93 km/h (50 knots). It entered the CHC Response Zone as a tropical storm of 65 km/h (35 knots) on September 19th. **Three people died** when their schooner ran ashore, plus crewmembers on another ship were injured when their schooner also ran ashore. The storm diminished the same day.

NEWFOUNDLAND

September 30, 1901

- The schooner *J. W. Roberts* ran ashore near St. Pierre, France and three of the crew drown (ET)
- Near Herring Cove, the schooner *Lucy M. Jenkins* struck Western Point and pounded herself to pieces. The crew narrowly escaped (ET)

1901–8

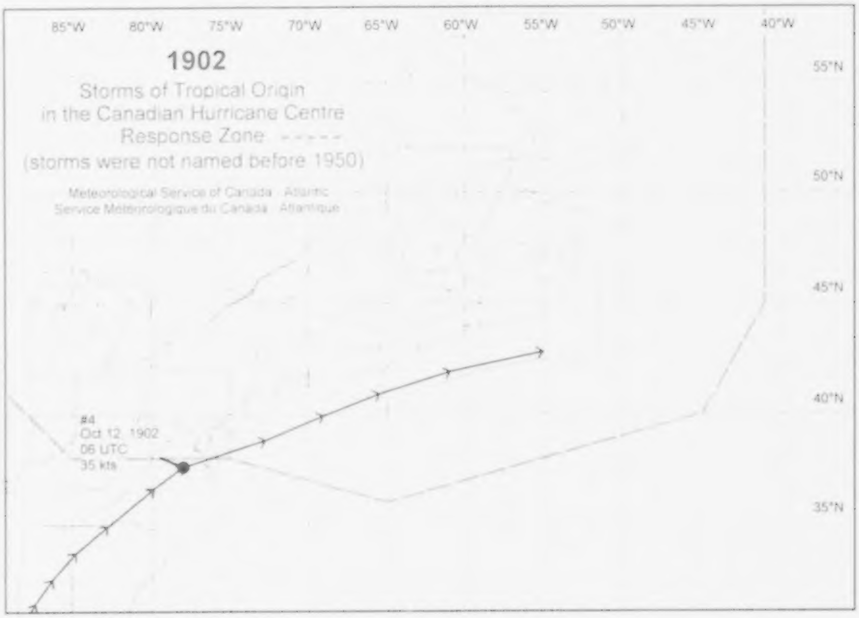
Storm #8 entered the CHC Response Zone on September 29th passing over Ontario, Quebec, and New Brunswick on September 30th as a tropical depression with winds of 46 km/h (25 knots). The storm strengthened to tropical storm status with winds of 65 km/h (35 knots) when it passed over Newfoundland on October 1st.

Storm #8 originated just north of Panama on September 21, 1901 and moved inland along the coast of the eastern United States. Storm #8 only reached tropical storm status and contained winds as high as 83 km/h (45 knots). The storm dissipated on October 2nd. No damage reports were found for this storm.

1901–9

Storm #9 began east of the Lesser Antilles on October 7, 1901. Only reaching tropical storm status, Storm #9 contained winds of 72 km/h (45 knots). It entered the CHC Response Zone on October 12th and Newfoundland waters on October 13th as a marginal tropical storm of 65 km/h (35 knots). It did not have any significant impact on Canada. Storm #9 dissipated on October 14th.

1902 – MAP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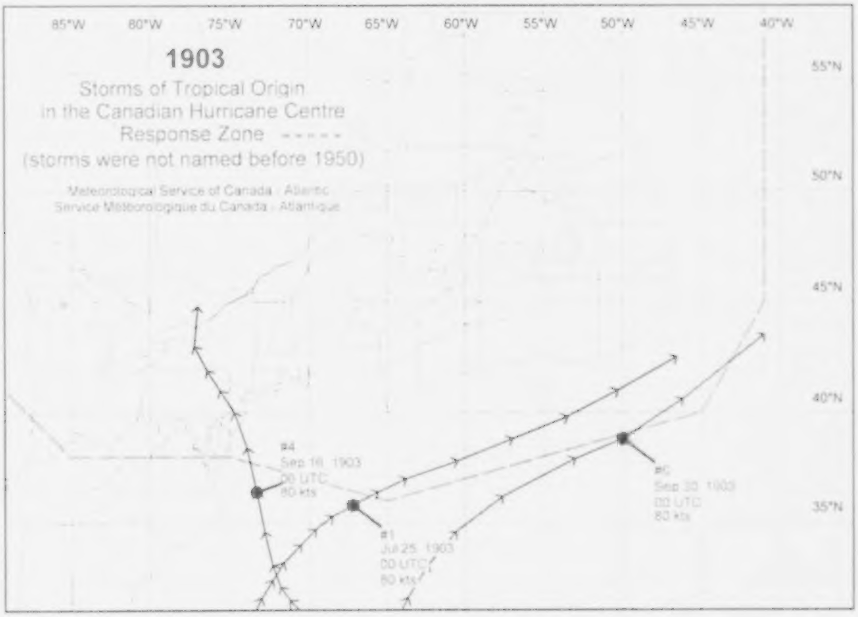
1902
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#4
Oct 12 1902
06 UTC
35 kts

1902–4

Storm #4 developed on October 3, 1902 west of Guatemala. This storm intensified into a category two hurricane and contained winds of 156 km/h (85 knots). Storm #4 entered the CHC Response Zone on October 12th as a tropical storm and Maritime waters on October 13th as it carried winds of 83 km/h (45 knots) through eastern Canadian waters. The system dissipated one day later on October 13th and did not cause any damage in Canada.

1903 – MAP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1903
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#4
Sep 16 1903
00 UTC
60 kts
#1
Jul 25 1903
00 UTC
80 kts
#6
Sep 30 1903
00 UTC
80 kts

1903–1

Storm #1 began on July 19, 1903 near the Lesser Antilles. This storm intensified into a category two hurricane bringing winds of 166 km/h (90 knots) at its maximum strength. Storm #1 entered the CHC Response Zone on July 25th as it was weakening. Within the CHC Response Zone, the system was classified as a category one hurricane and contained winds of 138 km/h (75 knots). Only lasting one day within the CHC Response Zone, Storm #1 dissipated on July 26th. No damage statistics were located for this storm.

1903–4

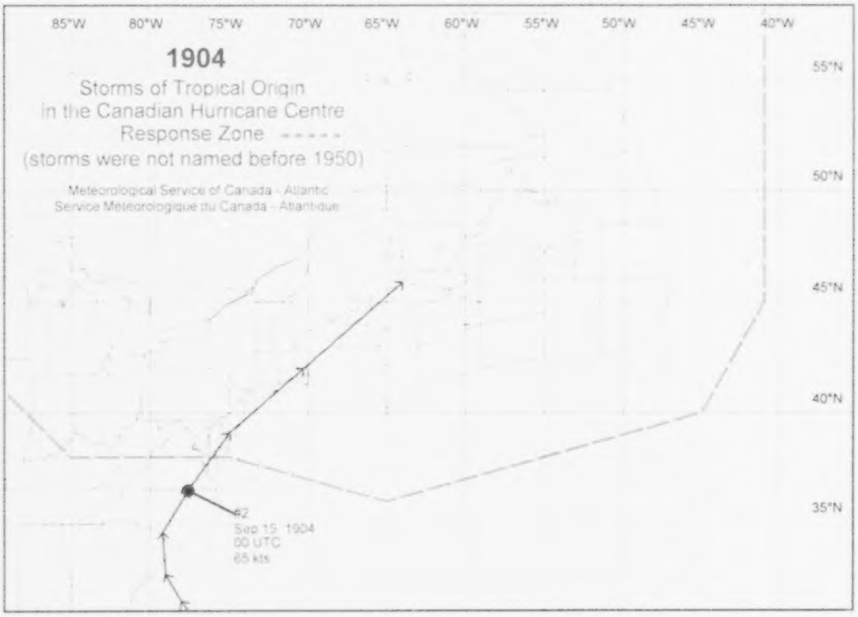
Storm #4 made landfall over Ontario as a tropical storm with winds of 74 km/h (40 knots) on September 17th.

On September 12, 1903, Storm #4 developed north of the Lesser Antilles and eventually intensified into a category two hurricane. This hurricane developed winds of 157 km/h (85 knots) at its maximum strength. The system entered the CHC Response Zone on September 16th as a category one hurricane containing winds of 129 km/h (70 knots). Storm #4 only lasted in the CHC Response Zone for one day before it dissipated on September 17th. No Canadian impacts were documented for this storm.

1903–6

Storm #6 developed on September 26, 1903 north of the Lesser Antilles. The storm intensified, and carried winds as high as 157 km/h (85 knots) making it a category two hurricane. Storm #6 entered the CHC Response Zone on September 30th and survived within the CHC Response Zone for only 12 hours. While within the CHC Response Zone it brought winds of 148 km/h (80 knots) and was at that point a category one hurricane. No damage was reported in Canada as a result of this storm.

1904 – MAP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35°N
1904
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#2
Sep 15 1904
00 UTC
65 kts

1904–2 † (1 Canadian fatality)

On the afternoon of September 15th, Storm #2 made landfall near Digby as a category 1 hurricane with winds of 120 km/h (65 knots) and continued on a path through the Bay of Fundy and onto northern Nova Scotia.

Storm #2 formed east of the Lesser Antilles on September 8, 1904 and traveled along the eastern seaboard of the United States. It strengthened into a category two hurricane with winds of 157 km/h (85 knots). The storm entered the CHC Response Zone on September 15th as a category one hurricane with winds of 120 km/h (65 knots) and traveled northward becoming weaker and dissipating later that day. **One woman was killed when a falling tree hit her.** Communication was disrupted in Nova Scotia and throughout Nova Scotia and New Brunswick, properties, structures, and sailing vessels were damaged. A railway in New Brunswick suffered a washout. The tidal bore on the Petitcodiac River was said to be the highest since the historic Saxby Gale of 1869.

NOVA SCOTIA

September 16, 1904

- A woman was killed by a falling tree on Tower Road in Halifax (HH)
- Winds of 83 km/h (45 knots) in Halifax (HH)
- Damage estimates of *$311,000* (mostly to buildings) (HH)
- 16 buildings burned as the winds fueled a fire on the lower side of Water Street, between Sackville and Prince Streets in Halifax (HH)
- In Truro, communication was cutoff when trees were uprooted and feel on the lines, the town streets were strewn with large tree branches and local business had their front windows smashed from the force of the wind (TJ)
- In Sydney, the *Golden Hope* and the *Mary Helen* fishing schooners were blown ashore and damaged heavily (TJ)
- Wind picked up gravel from the streets and dashed it against pedestrians, cutting like sharp hailstones and breaking glass on storefront windows (HH)

September 17, 1904

- Telephone system badly demoralized throughout the province (HH)
- Lunenburg suffered considerable damage. A fallen tree narrowly missed a driver and a marine slip was damaged to the extent of about *$200* (HH)
- In Digby, the *Quetay*, the *Nellie*, and the *Josie* schooners went ashore (HH)
- Other boats in the Digby area either sank or lost their sails (HH)

NEW BRUNSWICK

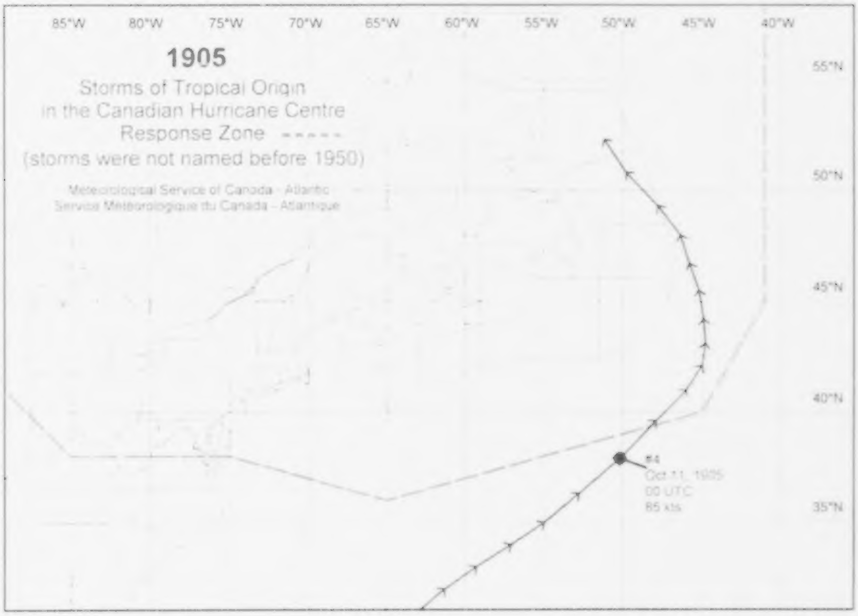
September 16, 1904

- In Saint John, 25 mm (1 in) of rain fell (TJ)
- A washout on the Canadian Pacific Rail Line at Welsford delayed trains carrying mail and passengers for a day (TJ)
- Four boats lost their sails and suffered other minor damages while trying to make it in port in Saint John's (TJ)
- The force of the wind was so great that small pebbles were caught up off the beach and hurled inland (TJ)

September 17, 1904

- The tidal bore on the Petitcodiac River was said to be the highest since the historic Saxby Gale (TJ)
- The flooding from the high tide ruined hay fields and property sustained water damage (TJ)

1905 – MAP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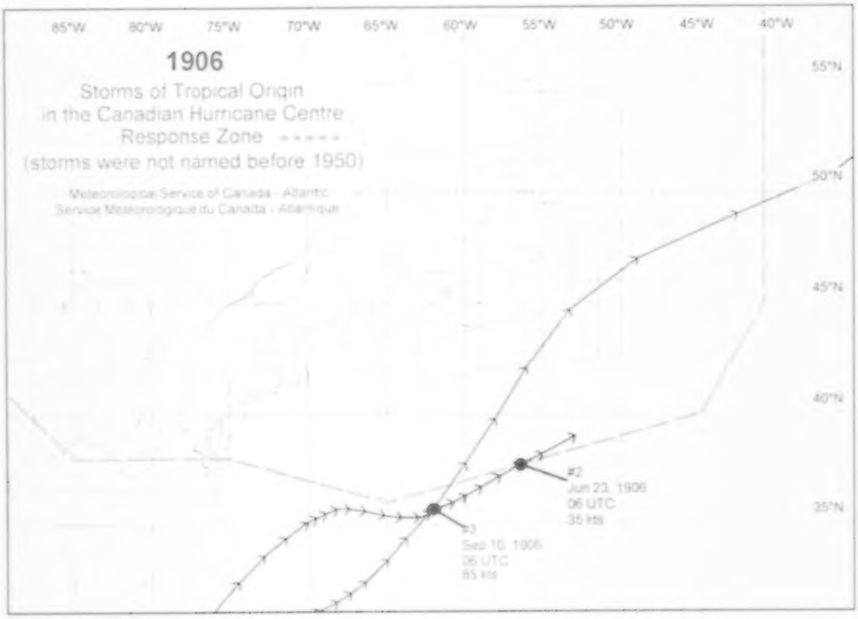
35°N
1905
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#4
Oct 11, 1905
00 UTC
85 kts

1905–4

Storm #4 originated in the Caribbean Sea on October 1, 1905. The storm brought winds of 157 km/h (85 knots) therefore making the storm a category two hurricane. Storm #4 entered the CHC Response Zone on October 11th at its maximum strength. It entered Newfoundland waters on October 13th as a 74 km/h (40 knots) tropical storm. It remained within the CHC Response Zone for two days before dissipating. No damage was reported in Canada from this storm.

1906 – MAP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1906
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#2
Jun 23, 1906
06 UTC
35 kts
#3
Sep 10, 1906
06 UTC
85 kts

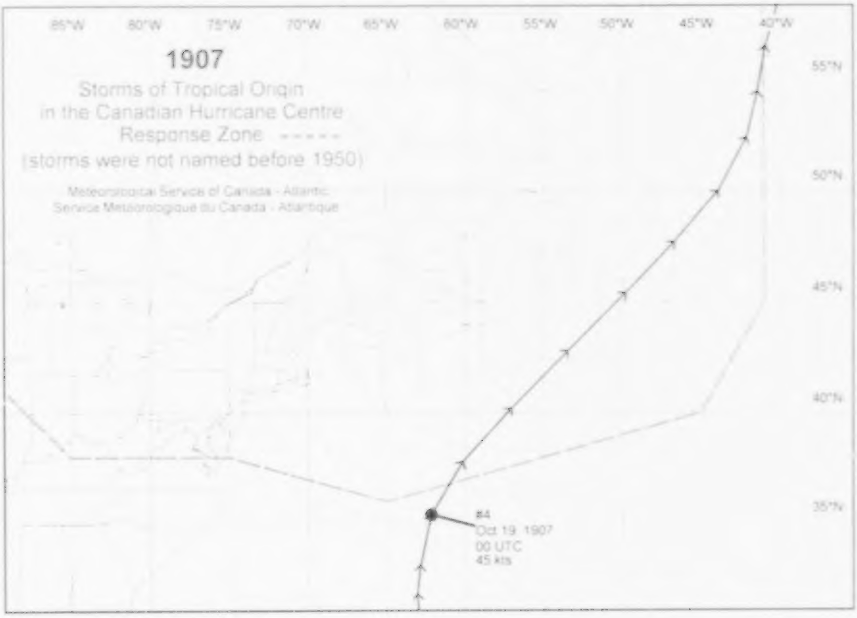
1906–2

Storm #2 began on June 4, 1906 off the east coast of Florida. This storm developed into a category two hurricane and contained winds of 167 km/h (90 knots). On June 23rd the storm weakened into a tropical storm with winds of 65 km/h (35 knots) as it entered the CHC Response Zone; however, the system dissipated that same day. No damage was reported as a result of this storm.

1906–3

Storm #3 began on August 25, 1906 south of Mexico and Guatemala. This storm developed into a category four hurricane, producing winds of 213 km/h (115 knots). The storm entered the CHC Response Zone on September 10th as a strong category two hurricane with winds of 167 km/h (90 knots) and entered Maritime waters late on the 10th with category 1 winds of 148 km/h (80 knots). This storm only remained within the CHC Response Zone for one day, exited on September 11th and dissipated on September 12th. No Canadian impacts were documented associated with this storm.

1907 – MAP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1907
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#4
Oct 19 1907
00 UTC
45 kts

1907–4

Storm #4 developed on October 17, 1907 southeast of Bermuda. The storm tracked east of Bermuda and travelled through the CHC Response Zone from October 19th to October 21st passing south of Newfoundland. The storm reached tropical storm strength with winds of 83 km/h (45 knots) and remained at this strength as it entered the waters of the Grand Banks on October 19th. Heavy rain was reported and several ships and schooners were damaged. Telegraph lines, trees, and fences were also blown down and property damage was reported.

NEWFOUNDLAND

October 22, 1907

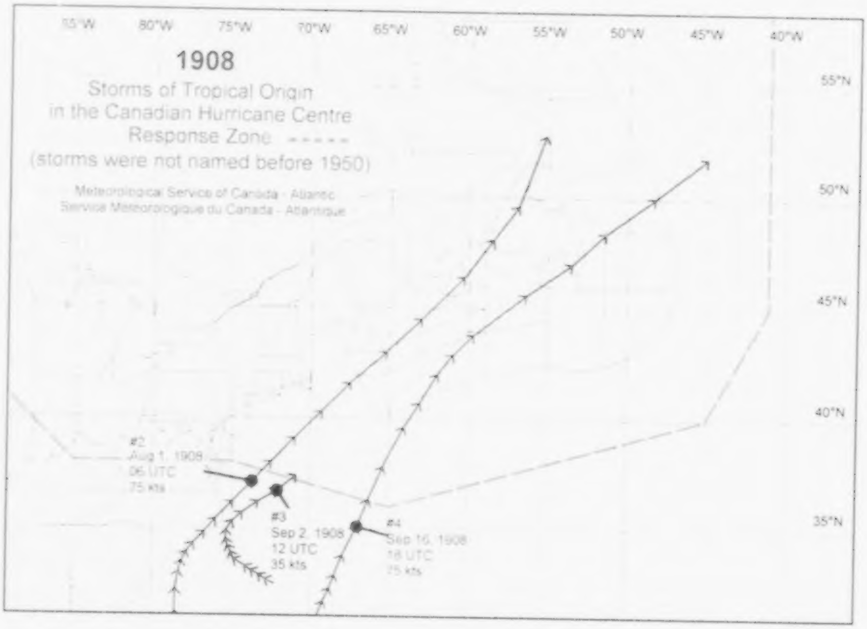
- Heavy downpours and gale force winds swept throughout the island causing considerable damage (ET)
- A chimney of a man's house was blown down on Saunders' Place (ET)
- Crosbie & Company's and several other fences were blown down. Trees were also blown down throughout St. John's (ET)

- The felt was blown off the roof of a house across from the East End Fire Hall (ET)
- Numerous ships in St. John's harbour broke their moorings and drifted ashore or collided with each other (ET)
- In Pouch Cove, telegraph poles were down and fences scattered (ET)
- In Torbay, a large number of trees had been uprooted (ET)
- The Ried Newfoundland Company's lines were knocked down west of Terra Nova. The Postal Telegraph lines were also down in several areas (ET)

October 23, 1907

- Several ships were driven ashore and wrecked in the Trinity and Conception Bay areas. The schooner *Bessie L.* was lost at Old Perlican. The schooner *Olivette* was lost at Bay de Verde. Two other schooners were lost at Kettle Cove near Low Point. No lives were lost in the wrecks (ET)
- In Bonavista, a gale from the northwest wrecked two small schooners (ET)
- In Lamaline, the storm sank one punt that was on its mooring and a large fishing vessel was washed out of the harbour and capsized (ET)

1908 – MAP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1908
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#2
Aug 1, 1908
06 UTC
75 kts
#3
Sep 2, 1908
12 UTC
35 kts
#4
Sep 16, 1908
18 UTC
75 kts

1908–2 † (8 Canadian fatalities)

Storm #2 made landfall near Sheet Harbour, Nova Scotia, as a category one hurricane with winds of 139 km/h (75 knots) on the early evening of August 2, 1908. It later made landfall in Newfoundland on August 3rd as a tropical storm with winds of 111 km/h (60 knots).

Storm #2 began off the east coast of Florida on July 25, 1908. The storm developed into a category two hurricane and brought winds of 157 km/h (85 knots). It continued along the eastern seaboard of the United States and eventually entered Maritime waters as a category 2 hurricane at 158 km/h (85 knots). Storm #2 remained within the CHC Response Zone from August 1st to August 3rd before it dissipated. **Eight people died when their boats capsized or were wrecked.** Many other ships were damaged in the storm. Winds and heavy rain swept through Nova Scotia damaging roads and uprooting trees.

NOVA SCOTIA

August 3, 1908

- Halifax recorded 123 mm (4.9 in) of rain in 12 hours and winds of 60 km/h (32 knots) (TJ)
- Many large trees were uprooted all over the city but especially on Coburg Road and Spring Garden Road, South Park and Hollis Streets in Halifax (HH)
- Many properties incurred damage in Halifax (HH)
- Unpaved streets in Halifax were washed away and only contained stones and were almost impassable (HH)
- Campers were stranded on McNab's Island for over a day (HH)
- The ferry service from Boston was long overdue with the ferry waiting offshore of Yarmouth for the storm to abide (HH)

August 4, 1908

- Many boats were damaged in Canso including an American yacht called the *Sweetheart* (HH)
- Several schooners and other boats were damaged or washed ashore in Queensport and Guysborough (HH)
- Lieutenant Governor Fraser's yacht was driven onshore at Bigsby Head and was badly smashed (TJ)

August 5, 1908

- Two Newfoundland fishing boats with three men each were lost at sea (HH)

NEWFOUNDLAND

August 3, 1908

- Two men drowned when their boat capsized at Savage on Bonavista Bay (ET)

QUEBEC

August 4, 1908

- At Isle-au-Bois near Blanc Sablon, the schooners *Victor*, *Mary Frances Enos*, and *Fortune Bay* were all lost (ET)

1908–3

Storm #3 originated off the east coast of South Carolina, about halfway between the coast and Bermuda on August 30, 1908. It developed into a tropical storm and contained winds of 83 km/h (45 knots) at its maximum strength. Upon entering the CHC Response Zone on September 2nd, the system had weakened to a tropical depression. At that point it contained winds of 46 km/h (25 knots) before dissipating the same day. No damage was reported in Canada because of this storm.

1908–4

Storm # 4 made landfall on the Avalon Peninsula of Newfoundland late on September 18th as a tropical storm of 104 km/h (56 knots).

Storm #4 developed east of the Lesser Antilles on September 7, 1908 and eventually became a category three hurricane with winds of 194 km/h (105 knots). It entered the CHC Response Zone and Maritime waters on September 17, 1908 as a category one hurricane of 128 km/h (69 knots) and made landfall on the Avalon Peninsula of Newfoundland late on the 18th as a tropical storm of 104 km/h (56 knots). Storm #4 dissipated on September 19th. The storm caused damage to boats along the south coast of Nova Scotia.

NOVA SCOTIA

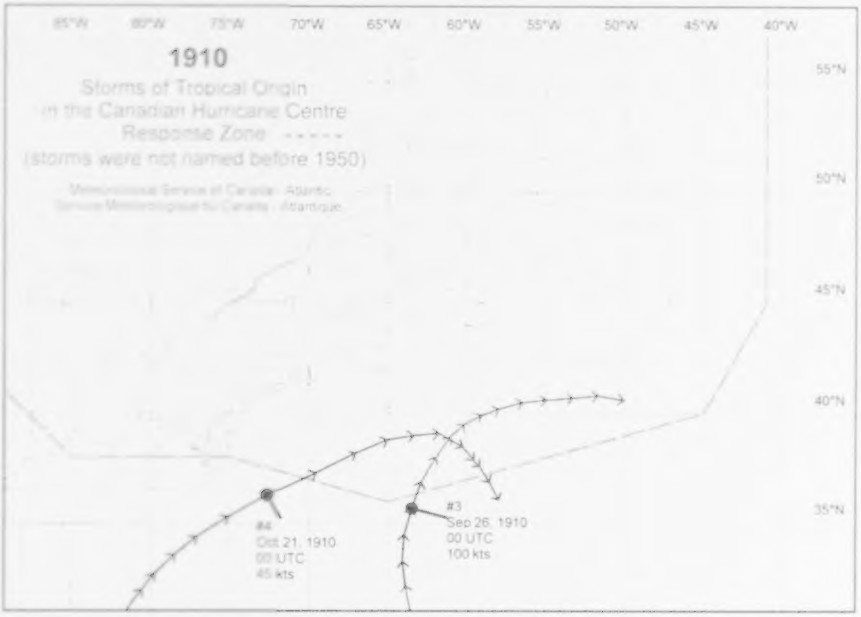
September 17, 1908

- Some boats sustained minor damage in Digby and along the south coast (TJ)

1909 – NO STORMS

No Storms in the CHC Response Zone in 1909.

1910 – MAP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1910
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada : Atlantic
Service Météorologique du Canada : Atlantique
#4
Oct 21, 1910
00 UTC
45 kts
#3
Sep 26, 1910
00 UTC
100 kts

1910–3

Reaching category three hurricane strength, Storm #3 developed on September 23, 1910 south-southeast of Bermuda. The storm entered the CHC Response Zone on September 26th at full strength, bringing winds of 185 km/h (100 knots) to the CHC Response Zone. While lasting for another two days, Storm #3 dissipated on September 28th. Storm #4 did not inflict any damage to Canada.

1910–4 † (1 Canadian fatality)

Originating off the coast near Panama, Storm #4 developed into a category three hurricane. Surviving from October 9th to October 23rd the hurricane contained winds reaching 194 km/h (105 knots) in strength. It entered the CHC Response Zone on October 21st as a tropical storm and exited the CHC Response Zone on October 23rd where it diminished. It brought winds of 83 km/h (45 knots) to the region and was responsible for **capsizing a boat in Lunenburg, killing one man.**

NOVA SCOTIA

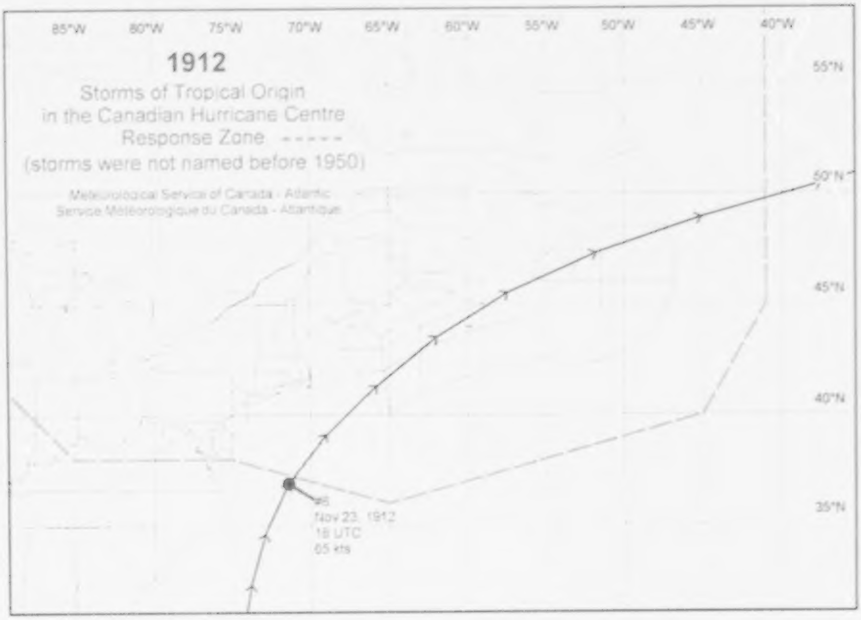
October 24, 1910

- One man from Black Rocks, a town near Lunenburg, was drowned when his boat capsized. His companion was rescued by another boat (HH)

1911 – NO STORMS

- No Storms in the CHC Response Zone in 1911

1912 – MAP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1912
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#6
Nov 23, 1912
18 UTC
65 kts

1912–6

Storm #6 made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on November 24th.

Storm #6 developed in the Caribbean Sea on November 11, 1912. The storm intensified into a category four hurricane and displayed winds of 214 km/h (130 knots) at its maximum strength. Storm #6 entered the CHC Response Zone on November 24th and entered Canadian waters as a marginal category one hurricane of 120 km/h (65 knots). It made landfall in Newfoundland on the 24th as a tropical storm of 102 km/h (55 knots). Storm #6 only lasted within the CHC Response Zone for 36 hours, as it dissipated on November 25th. No damage was reported in Canada.

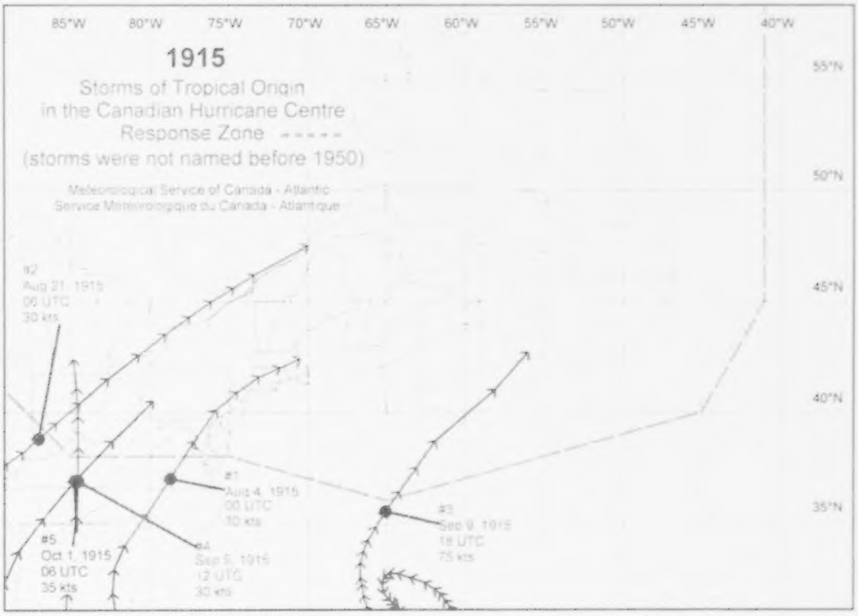
1913 – NO STORMS

- No Storms in the CHC Response Zone in 1913

1914 – NO STORMS

- No Storms in the CHC Response Zone in 1914

1915 – MAP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1915
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2
Aug 21, 1915
06 UTC
30 kts
#1
Aug 4, 1915
00 UTC
20 kts
#3
Sep 9, 1915
18 UTC
75 kts
#5
Oct 1, 1915
06 UTC
35 kts
#4
Sep 5, 1915
12 UTC
30 kts

1915–1 † (5 Canadian fatalities)

Storm #1 began on July 31, 1915 east of the Florida coastline. This system only developed into a tropical storm and carried winds of 83 km/h (43 knots) at its maximum strength. Storm #1 entered the CHC Response Zone on August 4th as it weakened into a tropical depression while moving up the east coast, and carried winds of only 46 km/h (20 knots). **Storm #1 took the lives of five people, who were killed in an a storm-induced automobile accident.** The storm also caused some damage to the crop fields within Ontario especially near Toronto. Storm #1 dissipated on August 5th.

ONTARIO

- Rainfall amounts: Kitchener had 180 mm (7.1 in), Brantford had 93 mm (3.7 in), Toronto had 109 mm (4.3 in), Agincourt had 125 mm (5.0 in), Stoney Creek had 83 mm (3.3 in) (MTB)

August 5, 1915

- Heavy lost to crops within Ontario (TS)
- Most damage is within a 48 km (30 mi) radius of Toronto (TS)

- Estimated of 40% of the grain was badly damaged by flattening in to the ground in Scarborough (TS)
- Slight damage was caused to the dredge work near the mouth of the Humber. This damage will be fixed within a few days (TS)

August 6, 1915

- Five people died when their automobile ran off a bridge near Utterson (TS)
- Ontario received heavy rain and winds as high as 96 km/h (52 knots) (TS)

1915–2

Storm #2 made landfall over Ontario as a tropical storm with winds of 65 km/h (35 knots) on August 22nd.

Storm #2 began on August 5, 1915 off the Cape Verde Islands. The storm developed into a category four hurricane and contained winds of 222 km/h (120 knots) at its maximum strength. However, upon entering the CHC Response Zone on August 21st Storm #2 had weakened into a tropical depression. It intensified again into a tropical storm and brought winds of 64 km/h (35 knots) as it entered Ontario, but then weakened again to a tropical depression before entering Quebec. Storm #2 remained within the CHC Response Zone until it dissipated on August 23rd. No damage reports were located for this storm.

1915–3

Storm #3 formed in the mid-Atlantic Ocean on August 28, 1915. The storm developed into a category three hurricane and contained winds of 194 km/h (105 knots) at its maximum strength. It entered the CHC Response Zone on September 10th as a category one hurricane and weakened to a tropical storm before entering Maritime waters later that evening. Within the CHC Response Zone, Storm #3 carried winds of 129 km/h (70 knots) before it diminished on September 11th and caused no damage.

1915–4

Storm #4 began on August 31, 1915 just south of Jamaica. This storm intensified into a category two hurricane and contained winds of 157 km/h (85 knots). Storm #4 entered the CHC Response Zone on September 5th as it was weakening into a tropical depression. Within the CHC Response Zone, it only brought winds of 46 km/h (25 knots). The system dissipated on September 6th not having damaged Canadian territory.

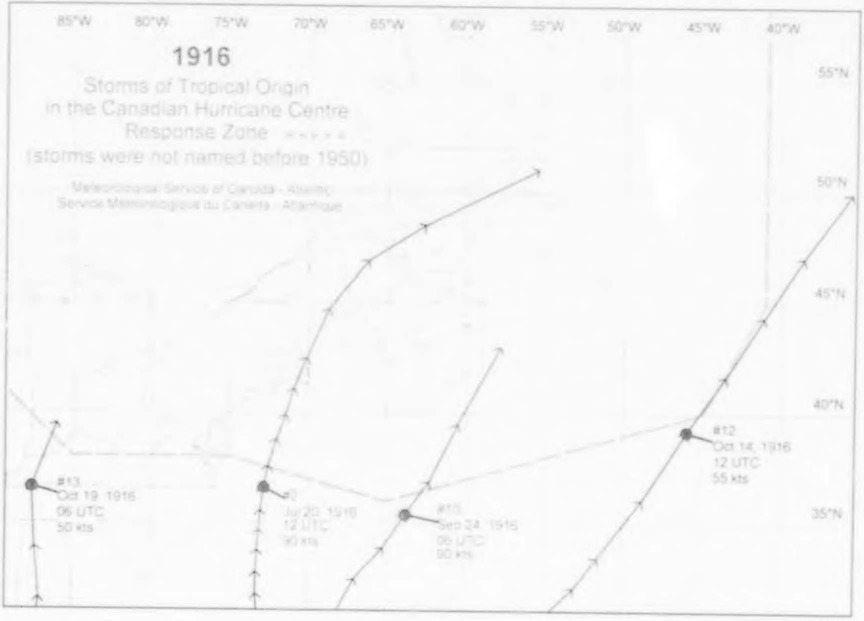
ONTARIO

- Listowel had 80 mm (3.2 in) of rain and Elora had 72 mm (2.8 in) of rain (MTB)

1915–5

Storm #5 developed near the Lesser Antilles on September 22, 1915. The storm contained winds as high as 213 km/h (115 knots) making it as category four hurricane. However, the storm was weakening quickly as it entered the CHC Response Zone on October 1st. Within the CHC Response Zone, it was downgraded into a tropical storm and only carried winds of 64 km/h (35 knots) and dissipated later that same day without impacting Canada.

1916 – MAP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1916
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#13
Oct 19, 1916
06 UTC
50 kts
#2
Jul 20, 1916
12 UTC
90 kts
#10
Sep 24, 1916
06 UTC
90 kts
#12
Oct 14, 1916
12 UTC
55 kts

1916–2

Storm #2 made landfall in New Brunswick and Newfoundland as a tropical storm with winds of 102 km/h (55 knots) and 65 km/h (35 knots) respectively, on July 22nd.

Storm #2 formed east of the Lesser Antilles on July 10, 1916, tracked east across the islands before recurving to the northeast entering the CHC Response Zone as a hurricane on July 20th. The hurricane made landfall in Massachusetts and Maine it was downgraded to a tropical storm before dissipating off the coast of Newfoundland on July 22nd. Wind speeds reached a maximum of 194 km/h (105 knots) in its entire history, 166 km/h (90 knots) in the CHC Response Zone, and were recorded at 101 km/h (55 knots) when it entered New Brunswick. No damage reports were located for this storm in Canada.

1916–10 † (12–19+ Canadian fatalities)

In the middle of the Atlantic Ocean between the Cape Verde Islands and the Caribbean, this storm formed as a tropical storm on September 17, 1916. Storm #10 tracked northwest until it turned to the northeast southwest of Bermuda, entering the CHC Response Zone on September 24th south of Nova Scotia and dissipating southeast of Cape Breton on September 25th. Wind speeds reached a maximum of 194 km/h (105 knots) or category three hurricane strength, and were still at category 2 strength, 157 km/h (85 knots), when it moved into Maritime waters. This storm did not landfall, but did have an impact on Newfoundland, mostly in coastal communities and sailing vessels. Several ships were lost and with them the crew, **the death toll was reported at twelve people, however other ships were reported missing with their crews.**

NEWFOUNDLAND

September 25, 1916

- Harbour Grace–*Eclipse* ashore–*Dorothy* on the bottom and *Minnie Maud* and *E. Morton* damaged (ET)
- Harbour Grace–wharf damaged, several motor boats sunk, barns, fences, and trees blown down and windows broken (ET)

September 26, 1916

- Trepassey–schooner *Bonnie Lass* with seven crewmembers was lost (ET)
- Another schooner with the *Bonnie Lass* was lost but the seven crewmembers were missing (ET)
- Reports of another coal laden vessel presumed sunk with the crew (ET)

September 27, 1916

- Placenta Bay schooner *Annie* missing (ET)
- Salmonier–*Senator* ashore (ET)
- St. Mary's–*S.S. White Sea* grounded and smashed on the rocks (ET)

October 3, 1916

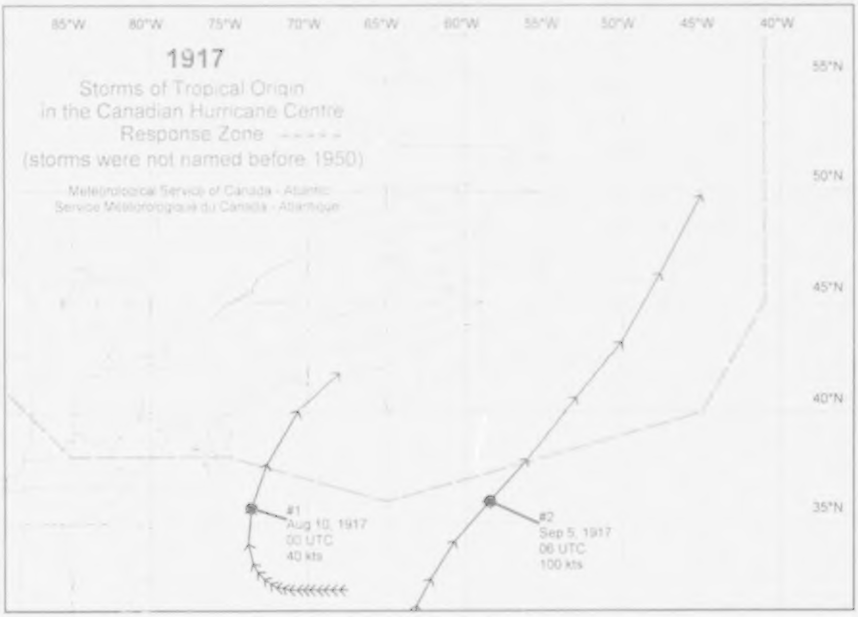
- The *Leta J. Schwartz* was lost with five crew members (BB)

1916–13

Storm #13 formed on October 12, 1916 in the Caribbean Ocean southeast of Jamaica, headed northwest across the Yucatan Peninsula, turning to the north, landfalling in

Florida, and tracking through Alabama and the American Midwest. The storm entered the CHC Response Zone on October 19th and dissipated six hours afterwards never having passed directly over Canadian territory. Winds speeds reached a maximum of 194 km/h (105 knots), although winds were recorded at 101 km/h (55 knots) when the storm entered the CHC Response Zone. No damage was reported in Canada as a result of this storm.

1917 – MAP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1917
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#1
Aug 10, 1917
00 UTC
40 kts
#2
Sep 5, 1917
06 UTC
100 kts

1917–1

Storm #1 originated in the Atlantic Ocean east of South Carolina near Bermuda on August 6, 1917. The storm curved to the northeast and entered the CHC Response Zone on August 10th, dissipating southwest of Nova Scotia that same day. Storm #1 reached tropical storm status with a maximum wind speed of 83 km/ h (45 knots), 74 km/h (40 knots) maximum in the CHC Response Zone. High winds were reported in Yarmouth where damage included broken glass and property damage, downed trees and power lines, and boats thrown ashore. Most damage occurred to shipping in the Yarmouth area and crops in the Annapolis Valley.

NOVA SCOTIA

August 11, 1917

- Halifax–reported wind speed of 51 km/h (28 knots) (HH)
- Halifax–overturned boat found in harbour–unknown whether anyone perished in the accident (HH)

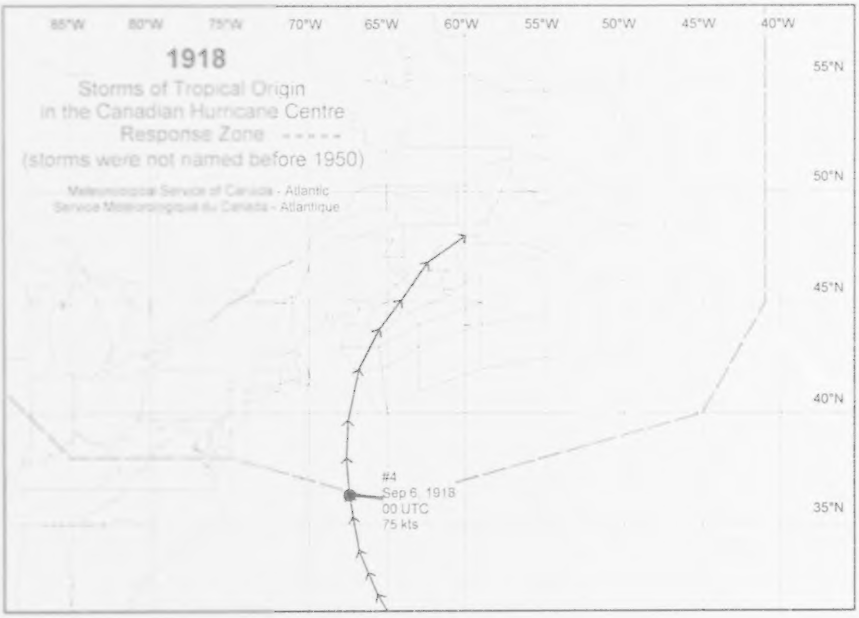
August 13, 1917

- Yarmouth–wind speed reported 105 km/h (56 knots) (HH)
- Ohio Station–man injured on train when winds tore the roof off (HH)
- Yarmouth–trees and wires damaged, glass broken, roofs torn off structures (HH)
- Approximately a dozen boats are ashore along the coast (HH)
- Crops damaged throughout the Annapolis Valley (HH)
- Estimated 15 barns are damaged or destroyed (HH)

1917–2

Storm #2 formed in the Atlantic Ocean between the Cape Verde Islands and the Lesser Antilles on August 30, 1917. Tracking northwest until it was located south of Bermuda, the storm turned to the northeast, entering Newfoundland waters as a category 2 hurricane of 167 km/h (90 knots) on September 5th. The storm tracked east of Newfoundland, dissipating east of the province on September 6th. Wind speeds reached a maximum of 194 km/h (105 knots), but were 185 km/h (100 knots) when it first entered the CHC Response Zone. No damage statistics were located for this storm.

1918 – MAP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35°N
1918
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#4
Sep 6, 1918
00 UTC
75 kts

1918–4 † (21 Canadian fatalities)

Storm #4 made landfall over Nova Scotia on September 6th as a tropical storm with winds of 102 km/h (55 knots), and over Prince Edward Island as a tropical storm with winds of 84 km/h (45 knots) on September 7th.

On September 2, 1918 Storm #4 developed east of the Bahamas, and intensified into a category two hurricane. The storm brought winds of 157 km/h (85 knots) at its maximum strength. While entering the CHC Response Zone on September 6th as a category one hurricane, Storm #4 brought hurricane winds of 121 km/h (65 knots) to Canadian waters. It made landfall in Nova Scotia as a tropical storm of 102 km/h (55 knots). The storm only lasted within the CHC Response Zone for one day before dissipating on September 7th.

NOVA SCOTIA

September 25, 1918

- *Otokio* was lost at Sober Island with 16 crew aboard (LPE, LAS)
- *Belle of Burgeo* was lost off Sambro Ledge with five crewmembers (SNL)

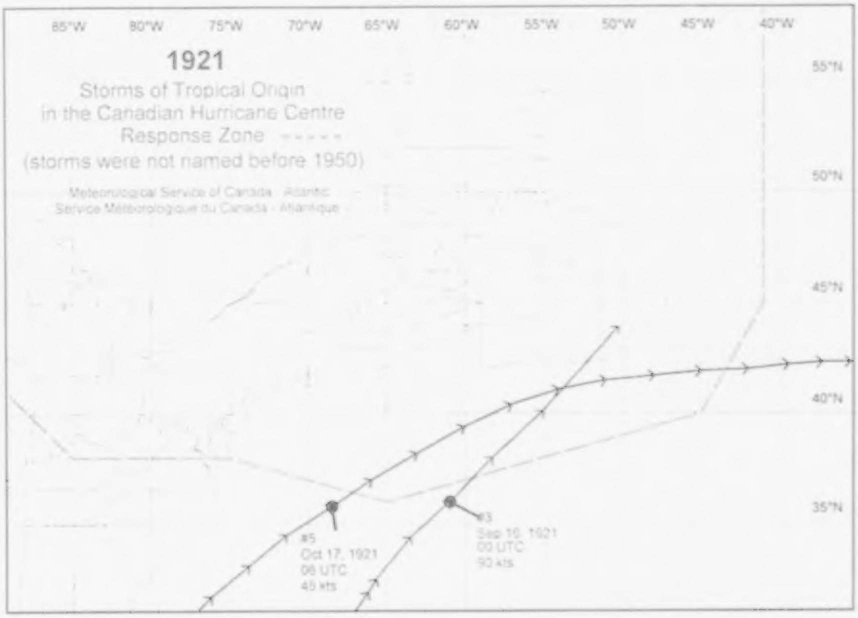
1919 – NO STORMS

- No Storms in the CHC Response Zone in 1919

1920 – NO STORMS

- No Storms in the CHC Response Zone in 1920.

1921 – MAP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40°N
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1921
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#5
Oct 17, 1921
06 UTC
45 kts
#3
Sep 16, 1921
00 UTC
90 kts

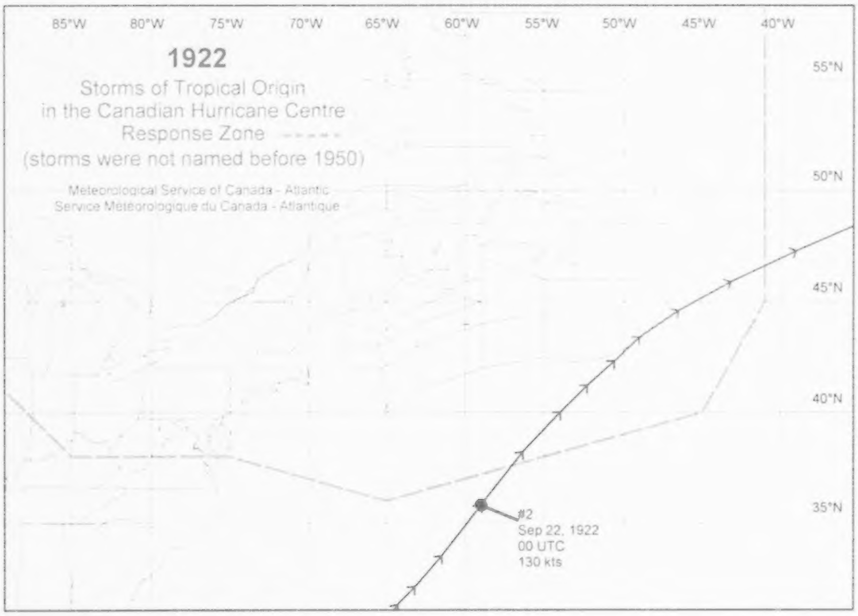
1921–3

On September 8, 1921, storm #3 formed in the southeastern Lesser Antilles. Maximum winds achieved were 195 km/h (105 knots) making a category three hurricane. Upon entering the CHC Response Zone on September 16th, winds were 167 km/h (90 knots), maintaining this strength as it tracked easterly through the Grand Banks. No impacts from the storm were reported.

1921–5

Storm #5 originated off the northeast Florida coast on October 16, 1921. This tropical storm traveled up along the United States east coast remaining over the water. Winds attained were only on the order of 93 km/h (50 knots). The storm entered the CHC Response Zone on October 17th and left promptly on October 19th. Storm #5 remained in the southern most portion of the CHC Response Zone as it traveled across in an east-northeasterly direction and no damage was reported.

1922 – MAP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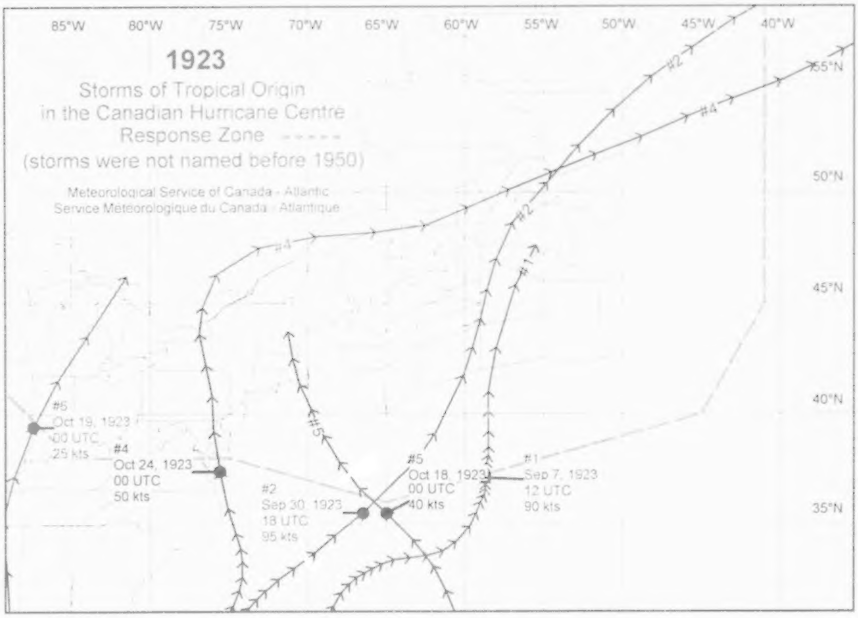
1922
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
55°N
50°N
45°N
40°N
35°N
#2
Sep 22, 1922
00 UTC
130 kts

1922–2

Storm #2 originated east of the Lesser Antilles on September 13, 1922. Intensifying into a category four hurricane, Storm #2 carried winds of 241 km/h (130 knots). This storm entered the CHC Response Zone on September 22nd, maintaining its category four strength. It weakened to category 3 winds of 176 km/h (95 knots) as it clipped the southeastern Grand Banks early on the 24th. After lasting within the CHC Response Zone for only 12 hours, Storm #2 dissipated on September 26th. No damage reports were located in Canada related to this storm.

1923 – MAP


85°W
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40°N
35°N
1923
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#1
#2
#4
#5
#6
Oct 19, 1923
00 UTC
25 kts
#4
Oct 24, 1923
00 UTC
50 kts
#2
Sep 30, 1923
18 UTC
95 kts
#5
Oct 18, 1923
00 UTC
40 kts
#1
Sep 7, 1923
12 UTC
90 kts

1923–1

Storm #1 made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on September 10th.

Storm #1 formed east of the Bahamas on August 30, 1923. Curving around Bermuda, and then tracking north, Storm #1 entered the CHC Response Zone on September 7th, entered the marine district as a 70-knot hurricane (130 km/h), and made landfall in Newfoundland as a 55-knot tropical storm (102 km/h) on September 10th. The strongest wind speeds recorded for the storm were 166 km/h (90 knots) and they were recorded within the CHC Response Zone. No damage was reported with this storm.

1923–2 † (2–9+ Canadian fatalities)

Storm #2 made landfall at Burgeo, Newfoundland on October 2nd at 1430 UTC. The category one hurricane passed over the province with winds of 130 km/hr (70 knots) and left the CHC Response Zone on October 4th.

Storm #2 formed east of the Dominican Republic on September 24, 1923. Storm #2 tracked northeast until east of the Bahamas, turned to the northeast, traveled parallel to the eastern seaboard, and entered the CHC Response Zone on September 30th. The storm entered Maritime waters on October 1st at category 2 strength (85 knots – 158 km/h) and made landfall near dawn in Newfoundland at 70 knots (130 km/h) on October 2nd. Maximum wind speeds recorded for this storm were 194 km/h (105 knots), although the maximum in the CHC Response Zone was 176 km/h (95 knots).

Nova Scotia was hit hardest by this storm with downed trees, telephone, telegraph, and power transmission lines, flooding, delays in train and ferry service, damage to shipping and fishing vessels, and lost crops. Prince Edward Island sustained similar losses, while New Brunswick, although suffering some damage, experienced benefits from the storm. **Newfoundland sustained casualties due to the storm when one man was killed in a train derailment and another fisherman was swept from the deck of his ship.**

NOVA SCOTIA

October 2, 1923

- Valley–reported winds between 74–105 km/h (40–57 knots) (TJ)
- Halifax–winds 64 km/h and rainfall 62 mm (2.5 in) (HH)
- Orchards in the Annapolis Valley sustain significant losses (HH)
- Trees down around the province–a falling tree downed the power line between Windsor and Kentville leaving both towns without electricity–telephone lines were down between Halifax and the Valley (HH)
- Train from Truro to Sydney cancelled due to poor track conditions, train from Montreal delayed on Folly Mountain due to a mud slide across the track (HH)
- North Sydney without power, ferry service cancelled and storm surging over low roads near harbour (HH)
- Two washouts on the train tracks between North Sydney and the causeway–low lying areas dangerous (HH)
- Inverness railway closed due to washouts (TJ)

October 3, 1923

- Hunters missing in the woods (HH)
- Sydney–rain for 31 hours totals 115 mm (4.5 in) (ET)

- Valley crops damaged estimated at between half and three quarters of the crops not yet harvested (HH)
- Stewiacke–recently harvested crops remaining in fields were flooded by the rising river and either washed away or ruined where they sat–livestock reported drowned in the fields (HH)
- Scatarie Island–French steamer *Yport* destroyed (HH)
- Washouts at Little Bras d'Or and Barachois prevented the Canadian National Railway train from reaching Halifax (HH)
- Sydney–40–50 houses submerged, bridges damaged, two cars covered by 4.5 m (15 ft) of water in a low lying area, telephone lines down, and road to North Sydney damaged by water (HH)
- Pugwash–roads submerged near Crescent Beach (HH)
- Amherst–residences and stores were damaged (HH)
- Port Phillips–lobster factory and mill destroyed (HH)
- Antigonish–grain that remained in the fields was mostly destroyed, gardens damaged, trees uprooted, and the apple crop destroyed (HH)
- Antigonish–roadways turned to rivers and damaged and bridges washed out and in the east end lower levels of buildings were flooded (HH)
- Vinten's dam near Antigonish was damaged (HH)
- Springhill Methodist Church lost its memorial window (HH)
- Windsor–commercial district damaged when a roof was torn off one shop and flung onto another (HH)
- The mail was lost between Guysborough and Canso when the driver and his team drove into a hole created by the rain (HH)
- Canadian National Railway between Sydney and Truro closed (HH)
- Truro–Stewart's bridge over the North River and Valley Station bridge over the Salmon River were both destroyed and McClure's mill damaged estimated cost *$500* (HH)
- North River Village–lost a barn, a temperance hall and a hen house (HH)
- Upper Onslow–North River overflowed its banks and covered the road from Onslow station to the Bible Hill race track (HH)
- Bible Hill–lumber manufacturing plant was damaged and logs and lumber was floated on the marshes (HH)

October 4, 1923

- The schooner *Arthur H. Zwicker* was missing with seven crewmembers (TJ)
- Annapolis Valley–estimated loss of apple crop *$250,000* (ET)
- The schooner *Cape Blomidon* was ashore at Port Hawkesbury, the *E.C. Adams* was ashore at River John, Pictou County (TJ)

October 6, 1923

- *$50,000* was the estimated damage to roads and bridges in Cape Breton and Victoria Counties (ET)

NEW BRUNSWICK

October 2, 1923

- Moncton–60 mm (2.4 in) of rain (HH)
- Saint John–winds 64 km/h (35 knots) (HH)
- Saint John–rainfall reported at 30 mm (1.2 in) (TJ)
- Moncton–many telephone, telegraph, electric lines are down or damaged and trees uprooted (HH)
- Much damage to crops expected (TJ)
- Saint John–trees and property damaged (HH)
- Ferry from Prince Edward Island had difficulty docking at Cape Tormentine due to high seas–delayed approximately an hour (TJ)

October 3, 1923

- Moncton–rainfall since Saturday 120 mm (4.8 in) (HH)
- Communication with Sackville and Nova Scotia down (TJ)

PRINCE EDWARD ISLAND

October 2, 1923

- Squalls upwards to 81 km/h (44 knots) (G)
- Trees down blocking roads in locations and crops were lost in the fields, orchards were stripped of fruit (G)
- Charlottetown–electric wires downed and telephone poles upset (G)
- Minor automobile accidents attributed to the storm occurred (G)
- Summerside–power was out to prevent damage from the storm (G)
- Telegraph lines to NB and NS down (G)

October 3, 1923

- Charlottetown–average winds were 68 km/h (37 knots) with gusts to 81 km/h (44 knots) (HH)
- 23 bridges were entirely destroyed or damaged (HH)
- Railroad washouts at Midgell and St. Peter's Bay (HH)
- Souris–schooner smashed into the shore when the anchor failed to hold (HH)
- Trees were uprooted, lobster factories wrecked and telephone and electric service crippled (HH)

- Rustico–a house floated off its foundations (G)
- Barns were destroyed killing a horse in Rustico, Tyron, and on Union road–barns were also damaged or destroyed in West River, Glenfinnan, Union River, and on Glasgow Road and Malpeque Road (G)

NEWFOUNDLAND

October 2, 1923

- Minor damage reported–trees, windows, and fences suffered damage (ET)
- At Duckworth and Cochrane, a brick building had a section of wall destroyed (ET)
- Smithville–two carriage sheds demolished by wind (ET)

October 3, 1923

- The schooner *Norman W. Strong* was lost with unknown number of crewmembers (SNL)
- A train was derailed because of a washout near Northern Bight and one man was killed (ET)

October 4, 1923

- Rose Blanche fishermen swept off fishing vessel and drowned (ET)
- *Jack Frost* broke free from her moorings and was smashed against the rocks (ET)
- The *Alice Roberts* was driven ashore at Port Au Bras, the schooner *Demerin Fairwel* was ashore at Beaverton, both the *Troutpool* and the steamer *Auroch* were ashore at St. Pierre, France (TJ)

October 5, 1923

- Roads between Peter's River in St. Mary's Bay and Holyrood in Conception Bay had many of the smaller bridges washed away and two bridges on Southeast Road were destroyed (ET)
- Cape Shore Road between Branch and Placentia saw the bridges badly damaged by washouts and Point Verde bridge has been badly damaged and the thoroughfare is closed (ET)

QUEBEC

October 4, 1923

- The Trans Atlantic liners *Majestic*, *Reliance*, and *Empress of Britain* delayed their departures due the storm (TJ)

1923–4

Storm #4 made landfall in Ontario as a tropical storm with winds of 65 km/h (35 knots) on October 25th. Landfall was also made over Quebec on the same day as a tropical depression with winds of 55 km/h (30 knots). On October 27th, landfall was made over Newfoundland as a tropical storm with winds of 65 km/h (35 knots).

Storm #4 formed in the Caribbean Ocean on October 14, 1923 north of Panama, crossed Cuba, made landfall in Maryland, traveled north and entered the CHC Response Zone on October 24th. On October 25th, the storm entered Canadian territory and exited the CHC Response Zone on October 28th. Maximum wind speeds for this storm were 111 km/h (60 knots) and 92 km/h (50 knots) within the CHC Response Zone. Quebec experienced a heavy rainfall that caused flooding resulting in damage to bridges and roads in the province.

ONTARIO

- Rainfall amounts: Brockville had 87 mm (3.4 in), Morrisburg had 67 mm (2.6 in), Ottawa had 51 mm (2.0 in) (MTB)

QUEBEC

October 25, 1923

- Montreal–rainfall totalled 70 mm (2.8 in) (MG)
- At the time of most intense rainfall the Wellington street subway was flooded with 1.2 m (4 ft) of water, delaying tramcar traffic (MG)

October 26, 1923

- Approximately 60 bridges damaged or destroyed by the heavy rainfall (MG)

1923–5

Tropical Storm #5 formed on October 15, 1923 east of the Greater Antilles. The storm headed northeast, turned to the northwest east of Bermuda, entered the CHC Response Zone on October 18th, and made landfall in Massachusetts. On October 19th, the storm dissipated over New Hampshire. Maximum wind speeds for this storm were reached in the CHC Response Zone at 83 km/h (45 knots) and no Canadian damage statistics were found for this storm.

ONTARIO

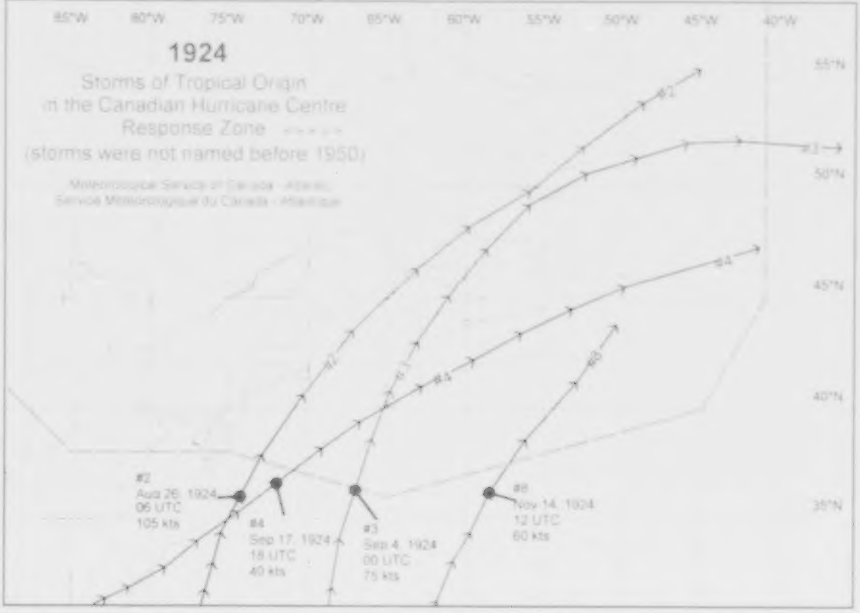
- Rainfall amounts: Sault Ste. Marie had 125 mm (4.9 in), Steep Hill Falls had 139 mm (5.5 in), Pagwa had 133 mm (5.2 in) (MTB)

1923–6

Storm #6 made landfall over Ontario as a tropical depression with winds of 46 km/h (25 knots) on October 19th.

Tropical Storm #6 formed on October 16, 1923 in the Gulf of Mexico. The storm made landfall in Mississippi, tracked northeast through the American Midwest and entered the CHC Response Zone on October 19th and dissipated shortly thereafter. Maximum wind speeds reached by this tropical storm was 83 km/h (45 knots) in the CHC Response Zone. No damage reports were located referring to this storm.

1924 – MAP


85°W
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40°N
35°N
1924
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2
Aug 26, 1924
06 UTC
105 kts
#4
Sep 17, 1924
18 UTC
40 kts
#3
Sep 4, 1924
00 UTC
75 kts
#6
Nov 14, 1924
12 UTC
60 kts

1924–2 † (26 Canadian fatalities)

Storm #2 made landfall near Digby, Nova Scotia and crossed Prince Edward Island as a category two hurricane early on August 27th with winds of 158 km/h (85 knots). It then continued on to central Newfoundland to make landfall at 1330 UTC as a category one hurricane with winds of 139 km/h (75 knots).

On August 16, 1924 a category four hurricane developed near the Lesser Antilles. It entered western Maritime waters on August 26th at 167 km/h (90 knots) and made landfall August 27th in Nova Scotia as a category 2 hurricane at 158 km/h (85 knots). **26 men were lost** when their schooners were wrecked at sea, and one man was lost and 52 people were injured on an ocean liner that was caught in the storm. Eight others were injured onboard another liner. There were many ships wrecked and fishing property damaged. Power was lost and damage was experienced to crops. The hurricane dissipated on August 28th.

- The *Anita and Bernice L.* lost with entire crew (at least 4 crew) (LAS)

NOVA SCOTIA

August 28, 1924

- The crew of six men onboard the schooner *Anna MacDonald* were lost as the schooner was smashed on the rocks at Kitty Witty Shoals south of Halifax, one mile off India Point (TJ,HH)
- A man from Yarmouth drowned when his schooner *Lizzie E.* wrecked on the Yarmouth Bar (TJ)
- 161 km/h (87 knots) winds and waves between 12–15 m (40–50 ft) in height (HH)
- In Bridgewater, winds were 81 km/h (44 knots) and windows were blown out, trees uprooted, and a roof of a round house was blown off (HH)
- Two schooners, *Golden Cup* and *Bridget and Freeman* sank at their moorings in North Sydney (HH)
- The schooner *Nellie Dixon* docked at Dobree's Wharf in Dartmouth broke from the mooring and crashed into another pier damaging both (HH)
- The yachts, *Hayseed IV*, *The Dixie*, *The Ace*, *Caprice*, and *Zelah* were damaged in Chester (HH)
- In Lunenburg, the tug *Mascotte* had here rails broken away (HH)
- The schooner *Richard B. Silver* broke away from its mooring in Lunenburg and ran into another ship. Damaged estimated at *$1,500* was done to the ship (HH)
- Two small schooners sank off North Sydney (HH)
- In the Northwest Arm, the yacht *Mary Jane* broke its moorings and wrecked into the yacht *Vagrant*. The *Vagrant* was overturned and the iron keel was broken off. The yacht *Chico* piled up on the shore (HH)
- Many dinghies also came ashore (HH)
- The schooner *Anna MacDonald*, which was a total loss, cost *$37,000* (HH)
- The steamer *Aspy* was a total wreck as she went ashore on the reefs at Long Point, Neil's Harbour. The crew and passenger were reported safe in Neil's Harbour. It is believed that there was a problem with the engines and the ship could not stay off the coast with the high winds (HH)
- The *Arabic Liner* which left Halifax for New York was damaged and 52 passengers were injured (HH)
- There is also fear for the schooner *Kathleen W* traveling to St. Pierre, France from Sydney (HH)
- The Yacht *Shanghai* was wrecked at White Point Bluff near Canso during the storm. The crew were able to make it ashore (HH)
- Schooners, yachts, dinghies, motorboats and other craft were damaged both in the harbour and in the arm (HH)
- The schooner *Fifi* of Peggy's Cove had its two spars snapped off (HH)
- A ferry steamer drifted 5 km (3 mi) down shore in Bras d'Or and went ashore on a beach (HH)

- Damage to trees, telephone, telegraph, and electric power were also reported throughout the city (HH)
- In Lockeport, the gale did a great bit of damage to the trees and gardens. In one instance, a tree broke and damaged one man's chimney (HH)
- A roof was blown off a man's barn (HH)
- In Chester, trees were damaged and there were damages done to the boats in the area (HH)
- Fallen trees blocked the roads between Bridgewater and Mahone Bay, and Bridgewater and Lunenburg (HH)
- In New Glasgow, trees, branches, polls all littered the streets between that town and Antigonish. The power was out in New Glasgow for most of the night (HH)
- Telegraph and telephone service were knocked out in New Glasgow and Antigonish (HH)
- The Canadian Pacific Rail telegraph switchboard office caught fire and caused damage to the building in New Glasgow (HH)
- In Pictou, The Highlanders tents were blown down (HH)
- A horse was killed when he encountered a live wire (HH)
- In Hantsport trees were uprooted and power was down in the area (HH)
- In Amherst, telephone and power service was knocked out. In addition, on Pleasant Street, a barn was blown down (HH)
- The roof canopy of the Garden structure and chimney pots hurled from Queen Hotel in Halifax and crashed through windows. It knocked down a massive traveling crane and broke one or two main pipes going to the sprinkler system. The hotel was not damaged but everything was torn away from the roof (G)
- Some damage was done to the building of National Drug and Chemical Company of Canada Limited (G)
- Smith's salt warehouse on Smith's wharf in Halifax, had it roof blown apart and some of it crashed down on the schooner Annie Louise causing considerable damage to the schooner (HH)
- In Kentville about 5% of the crop (mostly green fruit) was expected to be lost. The corn was blown down in areas; the grain was not expected to be greatly damaged (HH)
- In Windsor, considerable damage was done to the apple and fruit crops. Power was lost and the Falmouth fruit belt was reported to have third of its crops on the ground (HH)
- In Upper Stewiacke, there was damage to the grain and early apple crops (HH)
- Overall damage to the crop will be about 2% in the province (HH)

August 29, 1924

- The schooner *Lady Thorburn* broke her anchor and chain and became a complete wreck on the rocks at South L'Ardoise, Cape Breton. The crew made it ashore and were safe (HH)

- About six fishing boats at Lower Sandy Point broke their mooring and drifted ashore (HH)
- Barns at Lockeport lost their roofs in the gale (HH)

August 30, 1924

- Two men from St. Martin's River were drowned off Sable Island. One man was on board the schooner *Marie A. Spindler* and the other man was on the schooner *Jean Smith*. Both were washed overboard by heavy seas. Both ships had considerable damage to the deck. Most of the fixtures there were swept away including their dories, rail, main gaff, and main cable (HH)
- The schooner *Clara B. Creaser* from LaHave was also damaged in the storm but no crewmembers were injured (HH)
- In LaHave, the schooner *W.H. Eastwood* was driven ashore (HH)

September 1, 1924

- In East Dover, a heavy loss to the fishermen was felt in the area. It is estimated that it will be over ***$5,000*** of damage between Peggy's Cove and Prospect (HH)
- One man lost his ***$600*** seine (HH)
- At Mosher's Island, ***hundreds of dollars*** of fishing gear was lost (HH)

September 15, 1924

- The liquor shipments during the hurricane were hurt. The schooner *Eva June* lost 25 kegs of liquor. The Yarmouth schooner *Dawn* lost 300 cases of liquor (HH)

October 1, 1924

- The schooner *Beryl M. Corkum* capsized off Georges fishing bank and lost seven crewmembers (LPE)

NEW BRUNSWICK

August 27, 1924

- About 95 mm (3.8 in) of rain fell in Saint John (TJ) and about 40 mm (1.5 in) of rain fell in Miramichi (TJ)
- At Gagetown, rain was falling all day and there were high winds (TJ)
- One catch basin was reported to be flooded in West End Saint John (TJ)
- There were reports of downed power lines between St. Georges and St. Stephen (TJ)
- The line between Saint John and Richibucto was also reported to be down (TJ)
- Streetlights flickered in some towns but there were no reported power outages (TJ)
- Edmundston did not receive any effects of the storm (TJ)

August 28, 1924

- The rain played havoc with roads in Charlotte and Saint John Counties and it would cost *thousands of dollars* to repair them. The ditches were like running brooks and large chunks of earth were taken out from the roads (TJ)
- Outside St. George there was a hole in the road 60 cm (2 ft) wide and 30 cm (1 ft) deep. There were 12 cars in the ditch (TJ)
- In Moncton, there were many electrical outages and it caused the power station to go completely out of commission for a period of time (G)
- Telegraph service wires were also down in the Moncton area (G)
- The awning on Woolworth Five and Ten Cent Store in Moncton was torn away from its mooring and a rod crashed through a window in the store (G)

PRINCE EDWARD ISLAND

September 2, 1924

- A man was lost on a schooner that was lost just south of Nantucket. Two others from Gloucester, Massachusetts were lost (G)

QUEBEC

August 26, 1924

- The *Magno* was lost at the Magdalen Islands with 5 crew (ADG)

NEWFOUNDLAND

August 26, 1924

- The *Dorothy Lake* had one man wash overboard at Laugley Beach (NLR)

1924–3 † (2–12 Canadian fatality)

Landfall of this category one hurricane was made very early on September 5, 1924 over southeastern Cape Breton, Nova Scotia with winds of 120 km/h (65 knots). Storm #3 made landfall over Newfoundland as tropical storm with winds of 102 km/h (55 knots) on September 5th.

Storm #3 began east of the Lesser Antilles on August 26, 1924 and developed into a category two hurricane before entering Maritime waters on September 4th with winds of 138 km/h (75 knots). **Two men lost their lives and another 10 were missing when they**

abandoned their ship. Once entering the CHC Response Zone the hurricane lasted for another two days, ending on September 6th.

NEWFOUNDLAND

September 4, 1924

- The *Lillian M. Richards* had one man wash overboard at Grand Bank (TOS)

September 6, 1924

- One man from Newfoundland was lost on the schooner *Lucille Creaser* when he was washed overboard and drowned. The schooner lost all its sails in the gale and needed assistance getting ashore (HH)
- 10 men are missing from the schooner *Raymond* that was wrecked on the coast near Fortune (HH)
- The schooner *Arminta* was badly damaged in Corner Brook where it was tied to the pier. The constant pounding against the pier caused the damage (HH)
- Motorboats and small crafts were sunk in the harbour and buildings on the waterfront were damaged (HH)

1924–4

Storm #4 began on September 13, 1924 off the coast of Cuba. It developed into a category one hurricane, entered the CHC Response Zone on September 17th and tracked south of Nova Scotia and Newfoundland. Sustaining a maximum wind of 129 km/h (70 knots) and 74 km/h (40 knots) while in the CHC Response Zone and offshore Canadian waters, Storm #4 brought heavy rain to Nova Scotia but did not contain the normal winds that are associated with a storm of tropical origin. Storm #4 continued for another two days after entering the CHC Response Zone and diminished on September 19th.

NOVA SCOTIA

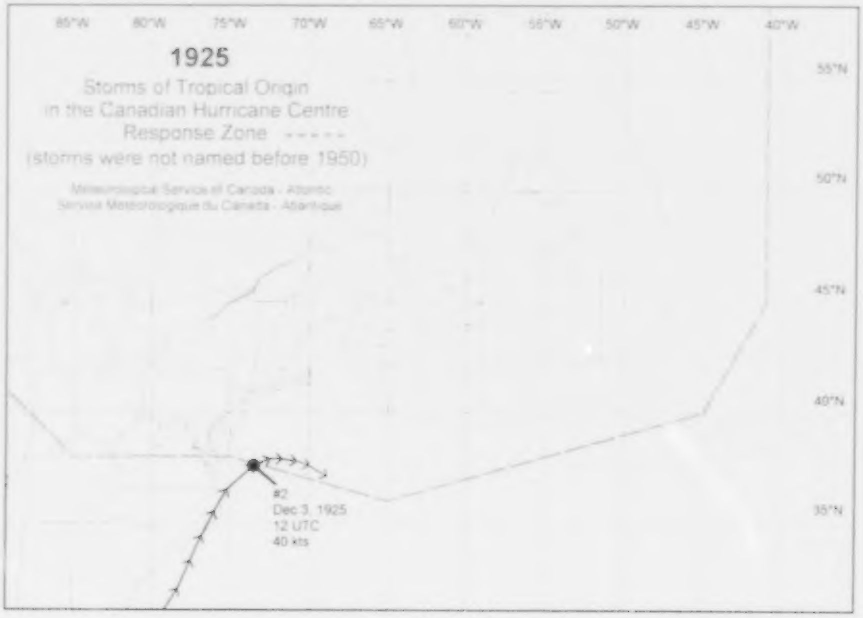
Sept 19, 1924

- 68 mm (2.7 in) of rain fell in Halifax in one of the heaviest rains of the year (HH)
- The storm was tropical but didn't contain the winds that normally come with these storms. It was accompanied by thunder and lightning (HH)
- The Canadian National Railway block signal near Fairview, was hit by a lighting strike and put out of running order (HH)

1924–8

Storm #8 began near the Greater Antilles on November 5, 1924. It developed into a category two hurricane and headed out into the Atlantic Ocean, east of Bermuda. Storm # 8 entered Newfoundland waters on November 15th as a tropical storm with winds of 111 km/h (60 knots) before dissipating. Storm #8 did not cause any damage reported in Canada.

1925 – MAP


85°W
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70°W
65°W
60°W
55°W
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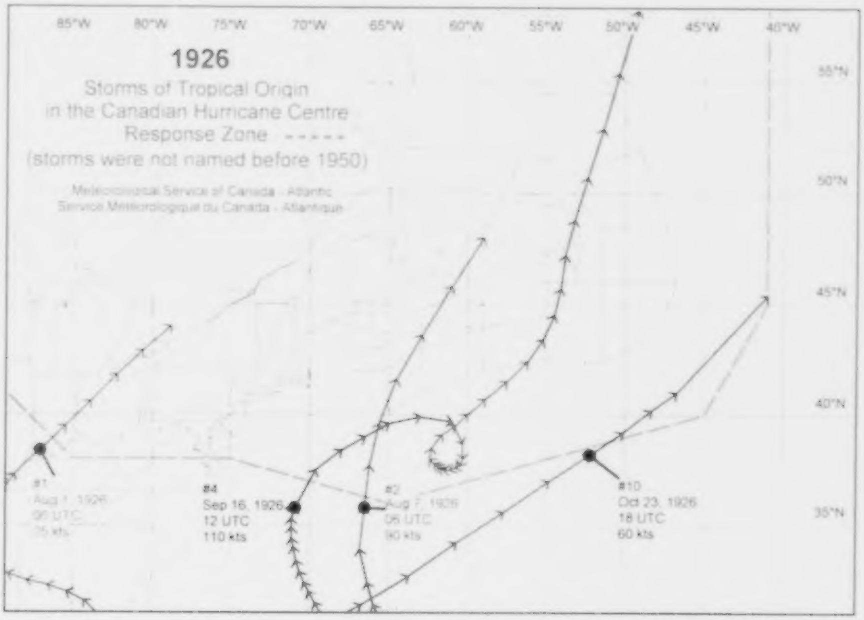
45°W
40°W
1925
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
55°N
50°N
45°N
40°N
35°N
#2
Dec 3, 1925
12 UTC
40 kts

1925–2

Storm #2 began on November 29, 1925 in the Caribbean Sea. This storm contained winds of 156 km/h (85 knots) at its maximum strength making it a category two storm. Storm #2 entered the CHC Response Zone on December 3rd as it was weakening into a tropical storm. It brought winds of 74 km/h (40 knots) to the CHC Response Zone. Storm #2 later dissipated on December 4th and did not cause any damage in Canada.

1926 – MAP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50°N
45°N
40°N
35°N
1926
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#1
Aug 1, 1926
06 UTC
25 kts
#4
Sep 16, 1926
12 UTC
110 kts
#2
Aug 7, 1926
06 UTC
90 kts
#10
Oct 23, 1926
18 UTC
60 kts

1926–1

Storm #1 made landfall in Ontario as a tropical depression with winds of 46 km/h (25 knots) on August 1st.

Storm #1 began on July 22, 1926 near the Lesser Antilles. The storm developed into a category four hurricane and contained winds of 222 km/h (120 knots) at its maximum strength. The hurricane entered the CHC Response Zone, and subsequently, Ontario, on August 1st as a tropical depression. Within the CHC Response Zone, it carried winds of only 46 km/h (25 knots). New Brunswick suffered some damage and the annual St. John's Regatta was postponed due to strong winds. The storm dissipated on August 2nd.

NEW BRUNSWICK

August 5, 1926

- Small building and trees were destroyed in the Campbellton area (TJ)
- Power lines between Campbellton and Metis, Quebec were damaged (TJ)
- Fences were blown down and some main roads were littered with debris (TJ)

- No reports of any lives lost (TJ)
- A four masted schooner was torn loose of it mornings (TJ)

NEWFOUNDLAND

August 7, 1926

- The annual St. John's Regatta was postponed due to strong westerly winds (ET)

1926–2 † (55–58 Canadian fatalities)

On August 8, 1926 at 1000 UTC, Storm #2 made landfall near Canso, Nova Scotia as a category one hurricane with winds of 130 km/h (70 knots). It then made landfall again later that day near Port Aux Basques, Newfoundland remaining as a category one hurricane, but with weaker winds of 120 km/h (65 knots).

Storm #2 began on July 31, 1926 east of the Lesser Antilles. Storm #3 intensified into a category three hurricane and contained winds of 194 km/h (105 knots) at its maximum strength. The system entered the CHC Response Zone on August 7th as a category two hurricane with winds of 166 km/h (90 knots) before weakening to 148 km/h (80 knots) as it entered Maritime waters. **49–52 crewmembers onboard two ships, which ran around on Sable Island, were lost. Five crewmembers onboard a Norwegian ship were lost** and one other was injured. The storm did considerable damage to many other ships and fishing gear through Nova Scotia and Newfoundland. Storm #2 lasted within the CHC Response Zone for one day before dissipating on August 7th.

NOVA SCOTIA

August 9, 1926

- Norwegian steamer *Ringhorn* was wrecked off Scatarie Island in Cape Breton. 12 crewmembers made it ashore; one of those being injured, five others died. Most of the crew were Norwegians but at least one was from Nova Scotia (HH)
- Halifax reported more that 65 mm (2.5 in) (HH)
- In New Harbour, Guysborough County, 11 ships were either driven to sea or wrecked (HH)
- The damages could not be estimated (HH)
- Some crops were damaged in Truro (HH)
- Fruit trees were badly damaged and branches were blow off many trees (HH)

- Damages were estimated in the ***thousands of dollars*** in the New Harbour region (HH)
- Some damage occurred to trees and shrubs in New Glasgow (HH)

August 10, 1926

- Homes in Chester were without phone service as lightning hit several poles and damaged houses (HH)
- Several small boats were washed ashore in the harbour (HH)
- In Kemptville, lightening destroyed one home and shed. Two cows were also hit and killed (HH)
- The loss of the 11 boats will be upwards to *$7,000* (HH)
- The cruiser *Patriot* was damaged in the storm, as waves crashed over the deck (HH)
- The steamer *Roman Prince* and the *Persian Prince* was damaged in the storm (HH)
- The steamer *Caledonia* was also damaged in the storm (HH)
- Two motorboats were wrecked at Mosher's Head (HH)
- Fishing gear and nets were badly damaged in LaHave (HH)
- A motorboat at Spectacle Island sank and was later raised (HH)

August 11, 1926

- Reports that the Lunenburg schooner *Sylvia Mosher* was wrecked off Sable Island. There was no sign of the 25–26 crewmembers and they are believed to be lost (G)
- The schooner *Edith Newhall* had one crewmember lost (LPE)

August 18, 1926

- Reports that the Lunenburg schooner *Sadie A. Knickle* was wrecked off Sable Island and 24–26 crewmembers were lost (LPE)

NEW BRUNSWICK

August 10, 1926

- Fredericton received 100 mm (3.9 in) of rain (G)

NEWFOUNDLAND

August 9, 1926

- High winds and torrential rain hit the western part of Newfoundland (ET)
- Telegraph lines were out of order (ET)
- The *S.S. Caribou* was delayed as it encountered high winds in its crossing (ET)

August 10, 1926

- A skiff was lost near Burgeo Islands during the storm but the crew were all rescued (ET)
- Many stage heads were swept clean and damaged by high winds in Labrador (ET)
- Lance au Loup reported nine small boats were broken up (ET)
- There were reports of other wrecks at Forteau and other places (ET)

August 11, 1926

- Labrador reported that four schooners were lost, but no crewmembers were lost (ET)
- Several other motorboats were lost (ET)

August 13, 1926

- The schooner *Blanche Forsey* was damaged in the storm off the Labrador coast (ET)

1926–4

Storm #4 made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on September 23rd.

Storm #4 began on September 2, 1926 in the mid-Atlantic Ocean. The storm developed into a category four hurricane and contained winds of 222 km/h (120 knots) at its maximum strength. Storm #4 entered the CHC Response Zone on September 16th as a category three hurricane but didn't reach southeastern Canadian waters until 6 days later when it entered on the 22nd as a weakening category 1 hurricane of 120 km/h (65 knots). It made landfall in Newfoundland a day later as a 102 km/h (55 knots) tropical storm. Within the CHC Response Zone, it brought winds of 203 km/h (110 knots). The storm remained within the CHC Response Zone until it dissipated on September 24th. Shipping and fishermen sustained losses from the storm in Nova Scotia and Newfoundland.

NOVA SCOTIA

September 22, 1926

- Winds were reported to be as high as 48 km/h (26 knots) but the seas were said to be tremendous (HH)
- Fisherman have sustained serious damage to their gear with loses estimated in to ***hundreds of dollars*** (HH)

September 23, 1926

- The yacht *Mary O'Connor* was abandoned 48 km (30 mi) south of Cape Sable after leaving Halifax. However all crewmembers were rescued (HH)

NEWFOUNDLAND

September 23, 1926

- Telegraph lines where down near Dawson's Cove (ET)

September 24, 1926

- The ship *S.S. Silvia* had a very stormy trip from Halifax to St. John's as 1 m (3 ft) of water flooded the deck (ET)
- The Post Office in Lamaline was blown down during the storm, but all the documents were recovered (ET)

1926–10

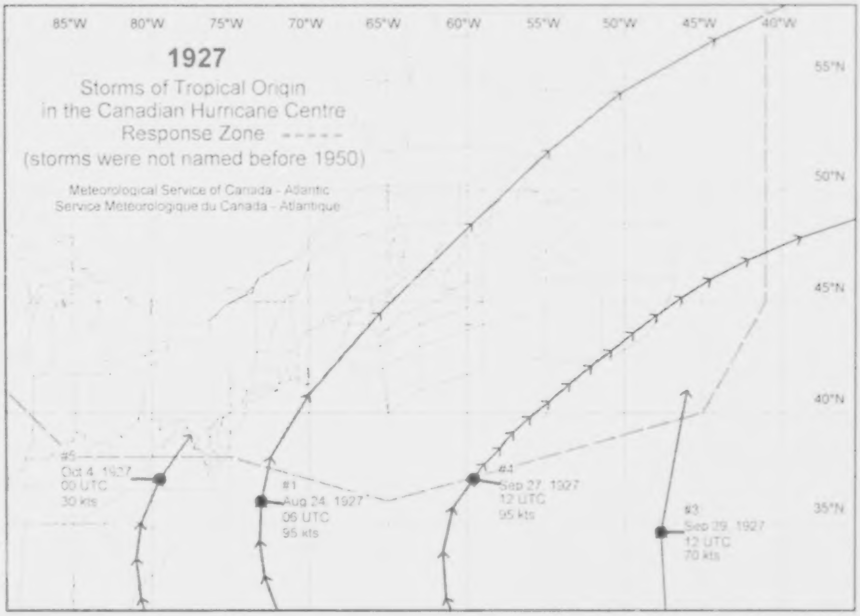
Storm #10 began on October 14, 1926 off the coast of Panama. This storm intensified into a category four hurricane with winds of 213 km/h (115 knots). The storm entered the CHC Response Zone on October 24th as a tropical storm. It carried winds of 111 km/h (60 knots) to the CHC Response Zone. The storm never lasted long in the CHC Response Zone as it dissipated the same day however delays were experienced in Newfoundland.

NEWFOUNDLAND

October 23, 1926

- An incoming express was delayed due to damaged road near Port au Basques (ET)

1927 – MAP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35°N
1927
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#5
Oct 4 1927
00 UTC
30 kts
#1
Aug 24 1927
06 UTC
95 kts
#4
Sep 27 1927
12 UTC
95 kts
#3
Sep 29 1927
12 UTC
70 kts

1927–1 † (173–192+ Canadian fatalities)

Storm #1 made landfall late on August 24th as a category two hurricane in Nova Scotia northwest of Yarmouth and crossed the province with winds reaching 166 km/h (90 knots). It then made landfall in eastern Prince Edward Island and Gros Morne, Newfoundland early the next day with the same strength as it had when it first hit Nova Scotia.

Storm #1 originated in the Atlantic Ocean east of the Lesser Antilles on August 19, 1927. The hurricane tracked northwest curving to the northeast near North Carolina and entered the CHC Response Zone on August 24th as a category two hurricane. Storm #1 was a major category three hurricane with maximum winds reaching 195 km/h (105 knots). The storm remained a hurricane as it tracked through the CHC Response Zone with maximum winds of 176 km/h (95 knots) and made landfall in Nova Scotia at 166 km/h (90 knots). The storm exited the CHC Response Zone on August 26th.

New Brunswick reported 6 deaths, Nova Scotia reported 11–15 deaths, and Newfoundland reported 156–171+ deaths. Newfoundland deaths mostly resulted from ships damaged or lost at sea in the storm. In Nova Scotia, New Brunswick, and Prince

Edward Island damage included power failures, flooding, structural damage, damage to crops, and dozens of sunken vessels.

August 24, 1927

- The Haligonian was lost at sea with all crew (NSD)

Nova Scotia

August 25, 1927

- 78 km/h (42 knots) winds in Halifax (TJ)
- Barometer reading was 976.5 mb (28.8 in) in Halifax (HH)
- Property damage of ***thousands of dollars*** in the province (HH)
- Vessels sunk along the shores of Nova Scotia (HH)
- Power outages and telephone services down across Nova Scotia and New Brunswick (TJ)
- Tram service in Halifax was out (HH)
- Argyle Street in Halifax was closed because the scaffolding was falling from the new Moirs plant (HH)
- Highways submerged along South Shore (HH)
- Schooner went ashore on the North Ferry Slip (HH)
- 21 m (70 ft) tower under construction at Exhibition Park was blown down (HH)
- Wall being constructed on Sackville Street crashed onto the street below (HH)
- Ferry service in Halifax harbour stopped for a few hours (HH)
- Small yacht sank in Halifax (HH)
- A gigantic electric crane collapsed in Richmond (HH)
- The grain elevator in the South End of Halifax was damaged (HH)
- All yachts and small boats drifted loose in the North West Arm that were originally tied up at St. Mary's Yacht Club (HH)
- Flooded streets and roads covered in debris across the province (HH)

August 26, 1927

- Three people drown from Tiverton off Digby (ET)
- Four died when the schooner *Stanley Hubley* was wrecked at Gabarus, Cape Breton (ET)
- Two bodies found close to the destroyed schooner *Sligo* near Prospect, Halifax County (ET)
- Four people missing and feared drowned from Nova Scotia (TJ)
- At least 20 boats sank off Cape Breton (ET)
- Schooners *J.O. Weston* and *Clementia* thrown ashore in Halifax (G)

- Uprooted trees and broken glass (G)
- Pier 9–steel crane collapsed (G)
- Communication with Prince Edward Island and Newfoundland disrupted (G)
- Over *$1 million* of damage (ET)
- Damage to crops and gardens and dozens of small ships destroyed or sunk (ET)
- 14 motor boats were smashed in Halifax harbour (ET)
- Six boats destroyed in St. Pierre, France (ET)
- Large warehouse destroyed in Sydney and thrown 15 m (50 ft) by the wind (TJ)
- Streets badly damaged in Digby (TJ)
- In Amherst, a barn blew over killing two valuable horses and injuring a third (TJ)
- Flooded basements and massive damage to roads throughout the province (TJ)
- Blew down houses, trees and fences in Springhill (TJ)
- Annapolis County road damage at *$150,000* (HH)
- Severe damage to orchards in Falmouth (HH)
- Railways washed out by storm from Bridgewater to Middleton (HH)
- Dykes in Kentville broken in several places (HH)
- Parts of the railway from Halifax to Yarmouth washed out (HH)
- Roof of the boiler house at the Pictou County Power Board's auxiliary power plants blew off, damage at *$500* (HH)
- Bridges damaged: two in Deep Brook, two in Clemensport, two on the main road between Bridgetown and Annapolis, Bath Bridge on the Bridgetown-Granville road, five on the Bay Shore Rd, two bridges on the Bridgetown-Paradise main trunk road, one bridge on the Annapolis River, one at Smith's, one at Rice's Creek, Shaw Bridge in Bear River plus many more (HH)
- Schooner was driven ashore and badly damaged in Stoney Island, Barrington (HH)
- *$2,500* of damage to three large fishing boats in New Harbour (HH)
- Tree fell across Water Street in Shelburne blocking traffic (HH)
- *$1,500* of damage to Wolfville streets (HH)

August 27, 1927

- One man washed overboard on his schooner, the *Julie Oppall*, near Sable Island (TJ)
- Two men injured on a boat on Georges Banks (HH)
- Large schooner destroyed in Upper Prospect (HH)
- Four large barns blew down in Whycocomagh, killing a horse and several livestock (HH)
- Barn animals drown in Kentville when their barn flooded and began to float down the water covered dykelands (HH)
- Two cars damaged in Yarmouth (HH)

- A bus which was parked on a wharf was washed into the sea in Yarmouth (HH)
- Yarmouth streets badly damaged, cost *$10,000* to repair (HH)
- *$500,000* total damage to roads (HH)
- *$50,000* of rum and whiskey sank with a schooner off Cape Breton (HH)
- Fisherman rescue an exhausted deer from Yarmouth harbour (HH)

August 29, 1927

- Body found off Low Point near Sydney harbour (HH)

August 31, 1927

- 100 mm (4.1 in) of rain fell at the Experimental Station in Kentville (TR)
- 250,000 barrels or 20% of the apple crop in the Annapolis Valley was lost (TR)
- Hundreds of acres of vegetables were uprooted and covered in water. Some farmers lost over 50% of their season's crops (TR)
- 20 to 25 washouts on the Dominion Atlantic Railway between Kentville and Yarmouth (TR)

NEW BRUNSWICK

August 25, 1927

- 85 mm (3.3 in) of rain in Saint John (TJ)
- Three people injured in car accident when their car tumbled into a culvert that was washed out at Horseman's Hill (TJ)
- Power outages and telephone services down across Nova Scotia and New Brunswick (TJ)

August 26, 1927

- 60 mm (2.4 in) of rain in Sussex (TJ)
- Culverts and bridges at Miller Cove, lower Main Street, Junction Road and Church Street were destroyed in Springhill (TJ)
- *$50,000* of damage in Westmorland County (TJ)

August 27, 1927

- Six people died when a skiff and its crew were lost (TJ)
- Railway lines destroyed throughout the province (TJ)
- *$1,000* damage to Chapman Creek railway lines (TJ)
- Damage to roads, bridges, gardens, boats and crops (hay and grain) across the province (TJ)
- Boats damaged in many places in New Brunswick (TJ)

- Considerable damage was done to University of St. Joseph's College when a dam broke flooded the area and the gymnasium blew over (TJ)

PRINCE EDWARD ISLAND

August 26, 1927

- 50 mm (2 in) of rain fell in Charlottetown and 45 km/h (24 knots) winds were recorded (TJ)
- Fruit trees and crops extensively damaged in Prince Edward Island (TJ)
- *$1,000* damage to buildings and fences at the Exhibition grounds (G)
- Minor flooding of roads (G)
- Charlottetown was littered with debris (G)

NEWFOUNDLAND

- The *Mystery II* sunk at Clattice Harbour. Two men were lost and one man made it to shore (WW)
- One man washed overboard on the *Mary Bernice* (WW)

August 27, 1927

- The schooner *Noxall* was lost with one crewmember washed overboard (HH)
- The schooner *McLaughlan* was lost in Placentia Bay with two crewmembers (HH)
- One life was lost in Curling when a large wave swept up the Humber River, extensive damage also done (HH)
- 145 km/h (78 knots) gale of wind in Curling (HH)
- Damage to circus tents and equipment totalling *$500* in Corner Brook (ET)

August 29, 1927

- 23–28 crewmembers were lost from the schooners *Loretta, Vienna, Valena* and *John C. Loughlin* in Placentia Bay (HH)
- The following schooners were lost with crewmembers: *Hilda Gertrude* (eight crew) lost off Rushoon; *Annie Healey* (seven crew) lost in Placentia Bay; *Ella or Effie May* (six crew) lost in Recontre West; *Annie Jean* (all crew) lost at Isle Aux Morts (SNL)
- The schooner *Columbia* was lost with 18 Canadian crewmembers and 5 American crewmembers (LAS)
- Seven men missing on a schooner off Merascheen Banks (HH)

September 27, 1927

- The schooner *Clayton Walters* was lost with 21–22 crewmembers, the schooner *Mahala* was lost with 20 crewmembers, the schooner *Joyce Smith* was lost with

22–24 crewmembers and the schooner *Uda R. Corkum* was lost off Sable Island with 19 crewmembers (BB)

1927–3

Storm #3 began on September 22, 1927 in the middle of the Atlantic Ocean southwest of the Cape Verde Islands. The storm tracked northeast, until it entered the lower eastern corner of the CHC Response Zone as a hurricane on September 29th. Storm #3 dissipated later that day. This storm began as a tropical storm, was upgraded to a category one hurricane with maximum winds of 139 km/h (70 knots), which were observed in the CHC Response Zone. Storm #3 remained at sea throughout its history and barely entered the CHC Response Zone, causing no impact on Canada.

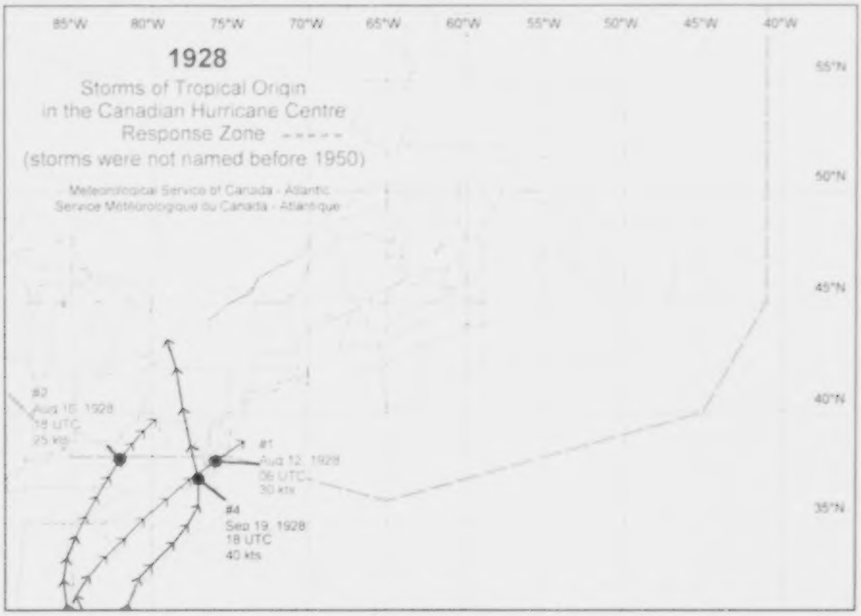
1927–4

Storm #4 formed as a tropical storm east of the Lesser Antilles on September 23, 1927. It tracked northwest attaining maximum wind speeds of 195 km/h (105 knots) before it turned northeast and entered the CHC Response Zone on September 28th. It weakened to a category two hurricane before entering the CHC Response Zone and moved into the southeastern Grand Banks on the 29th at 148 km/h (80 knots). It tracked northeast and was downgraded to a tropical storm before it left the CHC Response Zone on October 1st. Maximum wind speeds in the CHC Response Zone were 176 km/h (95 knots). This storm, although it developed high winds, remained at sea in the CHC Response Zone and did not impact land.

1927–5

Storm #5 was a tropical storm that formed near the Bahamas in the Atlantic Ocean on October 1, 1927. The storm tracked northwest until it made landfall in South Carolina, then it turned to the northeast, and was downgraded to a tropical depression before it entered the CHC Response Zone on October 4th. This storm reached maximum wind speeds of 92 km/h (50 knots) and only 46 km/h (25 knots) in the CHC Response Zone. Storm #5 did not impact Canada. It dissipated on October 4th.

1928 – MAP


85°W
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40°W
55°N
50°N
45°N
40°N
35°N
1928
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2
Aug 16, 1928
18 UTC
25 kts
#1
Aug 12, 1928
06 UTC
30 kts
#4
Sep 19, 1928
18 UTC
40 kts

1928–1

Storm #1 originated in the Atlantic Ocean near Barbados on August 3, 1928. The tropical storm tracked northwest across the Caribbean islands until storm strength increased to hurricane status in the Bahamas. Storm #1 made landfall in Florida, tracked across the state, entered Georgia as a tropical depression, turned to the northeast, tracked across the Carolinas, and entered the CHC Response Zone on August 12th off Virginia. Maximum wind speeds recorded for this storm were 157 km/h (85 knots) and within the CHC Response Zone, 56 km/h (30 knots). Canada was not impacted by this storm.

1928–2

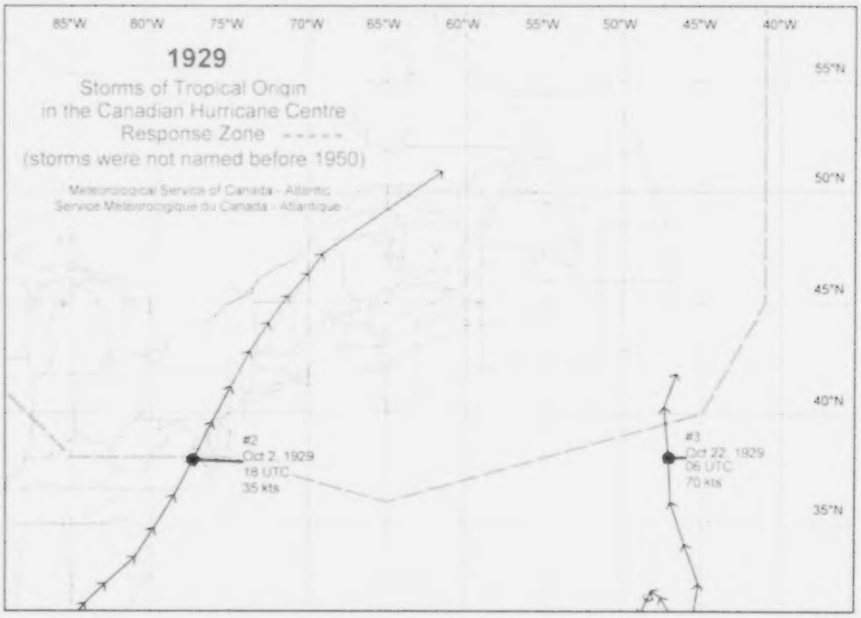
Storm #2 began in the Atlantic Ocean near Barbados on August 7, 1928, tracked northwest over the Caribbean, made landfall in Florida, tracked across Alabama, turned to the northeast, and entered the CHC Response Zone on August 17th over West Virginia.

The storm was classified a tropical depression when it entered the CHC Response Zone and dissipated shortly thereafter. Storm #2 reached hurricane status in the Caribbean with wind speeds measuring 130 km/h (70 knots); in the CHC Response Zone maximum wind speed recorded was 46 km/h (25 knots). This storm barely entered the CHC Response Zone and had no impact on Canada.

1928–4

Originating on September 6, 1928 in the Atlantic Ocean off the coast of Africa, Storm #4 tracked west across the ocean, northwest across the Lesser and Greater Antilles, and made landfall in Florida. The storm tracked north over the southeastern United States and entered the CHC Response Zone on September 19th in Virginia. Storm #4 continued north where it impacted Canada near Niagara-on-the-Lake, in Ontario, on September 20th, which is also the last track observation for this storm. Storm #4 was a major hurricane in the Caribbean, downgraded to a tropical storm over Georgia and finally a post tropical storm upon entry to Ontario. Maximum winds for this storm were 260 km/h (140 knots), 74 km/h (40 knots) in the CHC Response Zone, and 65 km/h (35 knots) when the storm entered Ontario. No damage was reported in Canada for this storm.

1929 – MAP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45°N
40°N
35°N
1929
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#2
Oct 2, 1929
18 UTC
35 kts
#3
Oct 22, 1929
06 UTC
70 kts

1929–2

Storm #2 made landfall over Quebec as a tropical depression with winds of 55 km/h (30 knots) on October 3rd. Storm #2 also made landfall over New Brunswick as a tropical depression with winds of 46 km/h (25 knots) on October 4th.

Originating near the Greater Antilles on September 22, 1929, Storm #2 became a category four hurricane with winds of 222 km/h (120 knots). It entered the CHC Response Zone on October 2nd but had weakened into a tropical storm containing winds of 64 km/h (35 knots) at that point. The storm caused flooding in Nova Scotia and New Brunswick as heavy rains were reported within the provinces. The storm dissipated on October 4th.

NOVA SCOTIA

October 4, 1929

- Highways in Colchester County flooded (HH)

- In Digby, streets were ankle deep with water and heavy damage was done to the roads (HH)
- In Truro, part of Prince Street between Louise and Lorne streets was flooded covering the lawns and sidewalks. The manholes could not carry the rain quickly enough (HH)
- Queen Street and Water Street were flooded in Truro (HH)
- Flooding of farms caused potatoes and roots to be submerged (HH)
- The Canadian National Railway station was flooded extensively (HH)

NEW BRUNSWICK

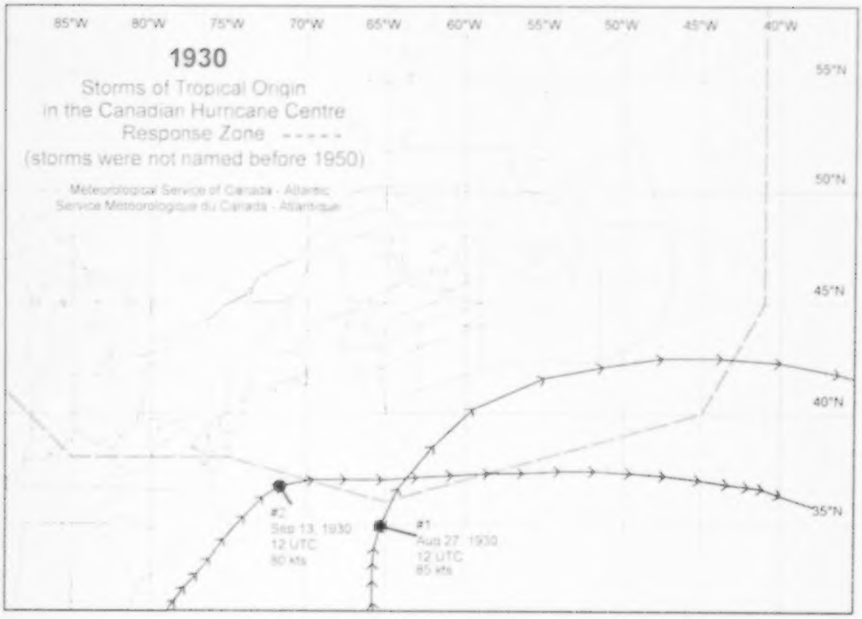
October 4, 1929

- Winds of 44 km/h (24 knots) were report in Saint John (TJ)
- 95 mm (3.8 in) of rain fell at Douglas Avenue, Saint John (TJ)
- Cellars and streets were flooded with 0.3 m (1 ft) of water in the Saint John area (TJ)
- Sodden cables caused the disruption of telephone service and soaked battery cables caused the disruption motor vehicles in Saint John (TJ)

1929–3

Storm #3 originated in the mid-Atlantic on October 15, 1929 and remained off shore for its entire life span. It had a maximum strength of 148 km/h (80 knots) winds making it a category one hurricane. It entered the CHC Response Zone on October 22nd with winds of 120 km/h (65 knots) and dissipated the same day.

1930 – MAP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40°N
35°N
1930
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2
Sep 13, 1930
12 UTC
80 kts
#1
Aug 27, 1930
12 UTC
85 kts

1930–1

Storm #1 began on August 21, 1930 east of the Lesser Antilles. The system developed into a category two hurricane, containing winds as high as 167 km/h (90 knots). The storm entered the CHC Response Zone on August 27th as a category one hurricane and brought winds of 93 km/h (50 knots) within the zone. Storm #1 left the CHC Response Zone on August 29th and dissipated on August 31st.

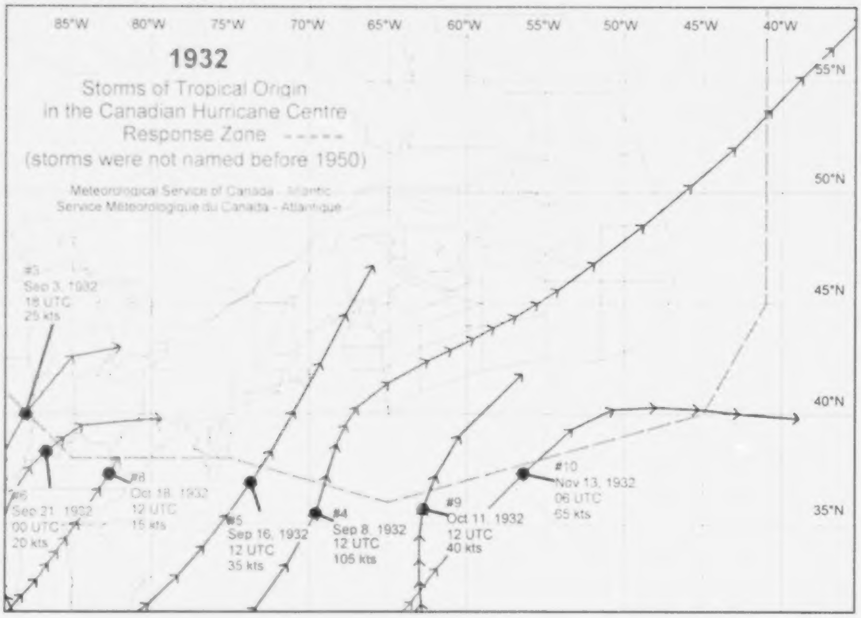
1930–2

Storm #2 originated east of the Lesser Antilles on August 31, 1930. This storm intensified into a category four hurricane and contained winds of 241 km/h (130 knots) at its maximum strength. The system entered the CHC Response Zone on September 13th as a category two hurricane, however, it strengthened within the Response Zone to a category three hurricane, bringing winds of 204 km/h (110 knots) before leaving on September 14th. The storm diminished three days later on September 17th.

1931 – NO STORMS

- No Storms in the CHC Response Zone in 1931

1932 – MAP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55°N
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40°N
35°N
1932
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#3
Sep 3, 1932
18 UTC
25 kts
#6
Sep 21, 1932
00 UTC
20 kts
#8
Oct 18, 1932
12 UTC
15 kts
#5
Sep 16, 1932
12 UTC
35 kts
#4
Sep 8, 1932
12 UTC
105 kts
#9
Oct 11, 1932
12 UTC
40 kts
#10
Nov 13, 1932
06 UTC
65 kts

1932–3

Storm #3 made landfall over Ontario as a tropical depression with winds of 37 km/h (20 knots) on September 4th.

On August 26, 1932, Storm #3 formed as a tropical storm in the Atlantic Ocean east of the Greater Antilles. The storm tracked northwest across the Bahamas and Florida, crossing into the Gulf of Mexico where the storm strength increased to a category one hurricane with maximum winds of 130 km/h (70 knots). Storm #3 made landfall in Mississippi, crossed into Louisiana losing strength until it was classified as a tropical storm, turned to the north where it was downgraded further to a tropical depression, and then angled to the northeast. The storm entered the CHC Response Zone on September 3rd and entered the border of Ontario September 4th before dissipating shortly thereafter. Maximum wind speeds in the CHC Response Zone were 46 km/h (25 knots) and no damage was reported in Canada as a result of the storm.

1932–4 † (14–15 Canadian fatalities)

Tropical Storm #4 formed in the Atlantic Ocean east of the Virgin Islands on August 30, 1932, tracked northwest over the Bahamas as it strengthened to a hurricane, then turned towards the northeast, and entered the CHC Response Zone on September 8th. The hurricane entered southwestern Canadian waters near noon on September 9th, passed south of Sable Island, Nova Scotia, and came close to the Avalon Peninsula of Newfoundland as a post tropical storm before leaving the CHC Response Zone on September 12th. Maximum winds for the entire storm were 260 km/h (140 knots), within the CHC Response Zone the maximum wind speed was 185 km/h (100 knots). **14–15 people died due to the storm's impact on fishing and sailing vessels.** Flooding, structural, and crop damage also ensued in Nova Scotia and coastal communities in all four Atlantic provinces saw their harbours and inshore boats damaged.

NOVA SCOTIA

September 10, 1932

- The storm delayed a steamer arriving in Yarmouth (TJ)

September 12, 1932

- The steamer. *Watford*. wedged on jagged rocks in Glace Bay, two crewmembers lost (TJ)
- 130 km/h (70 knots) in Halifax (TJ)
- 52 km/h (28 knots) in Cape Breton (TJ)
- Barge sank in Hants County with 350 cords of pulpwood (MG)
- 18 small fishing boats and a pleasure craft were submerged in Canso harbour (MG)
- Chimney of the United Church crashed through the roof of the church in Canso harbour (MG)
- In Beaconsfield, a small hotel, residences, and two garages were lost in a fire during the storm. damage at *$33,800* (HH)
- Annapolis valley lost 10% of their 1.1 million apple crop (MG)
- Three boats ashore at Scatarie Island (MG)
- Liquor carrier had gone ashore near Lingan, Cape Breton (TJ)
- Roads in Glace Bay were flooded (MG)

September 13, 1932

- Phone lines and some power lines down in Cape Breton (HH)
- Locomotive track and many roads washed out in Cape Breton (HH)
- Amherst–*several thousands of dollars* damage to lobster fishing equipment (HH)
- Several small building were blown down at Pugwash (HH)

- Damage done to wheat and grain crops in Cheticamp (HH)

September 20, 1932

- One man washed overboard on the *Mary H. Hirtle* near Sable Island (BB)

September 23, 1932

- Schooner *Patara* left southern Labrador on September 7th and was lost with seven to eight crewmembers (TJ, IPS)
- The schooner *BeeBee* was lost with four crewmembers (IPS)

NEW BRUNSWICK

September 10, 1932

- No damage to Shediac (TJ)

PRINCE EDWARD ISLAND

September 12, 1932

- 105 km/h (57 knots) winds at Little Cape (G)
- 25 fishing boats lost at Little Cape (G)
- Steamer, *Odensholm* wrecked in Cappa Hayden (G)

NEWFOUNDLAND

September 12, 1932

- Six fishing boats sank at Pouch Cove (HH)
- Crew abandoned a steamer off Burnt Point and the vessel was destroyed (HH)

September 14, 1932

- A schooner was lost at St. Brendan's (TJ)
- 16 smacks and all fishing stages destroyed in Leading Teakles (TJ)
- Two houses and a church were blown over in Culdesac (TJ)

1932–5 † (1–9 Canadian fatalities)

Storm #5 made landfall over New Brunswick as a tropical storm with winds of 65 km/h (35 knots) on September 17th.

On September 9, 1932, in the Gulf of Mexico north of Mexico's Yucatan Peninsula, Tropical Storm #5 began. The storm tracked north across Florida, entered the CHC Response Zone on September 16th, made landfall in Maine and wind speeds reached 83 km/h (45 knots) in the CHC Response Zone. When the storm entered the CHC Response Zone, it had been downgraded to a post tropical storm. **One fisherman was lost at West Point, Prince Edward Island. One vessel went missing with a total of 8 crew.** Damage reported in Nova Scotia, New Brunswick, Prince Edward Island, and Quebec included flooding, utility services disruptions, crop and structural damage, and in coastal communities, damage to vessels and shore fixtures.

NOVA SCOTIA

September 19, 1932

- Fishing boats went ashore and vessels were torn from their mooring across Nova Scotia (TJ)
- Telephone and telegraph services were down, many boats destroyed and trees blown down across Nova Scotia (TJ)
- Roofs blew off of a few houses in Amherst (HH)
- Four boats were driven ashore and one was destroyed in Westport (HH)
- Wharf in Chester was destroyed and a number of small boats washed up on shore (HH)
- House burned down in Yarmouth, damage was *$3,000* (HH)
- Storm also put out two fires in Grand Lake and Antigonish (HH)
- Considerable damage to a schooner in Parrsboro (HH)
- 75% of the apple crop destroyed in Annapolis Valley (MG)

September 20, 1932

- Seven men were injured when a wave washed over the deck of their boat in Sydney (G)
- The oldest landmark in Annapolis Royal was destroyed: a 400 year old French willow tree broke into three pieces on Saint George Street (HH)

September 23, 1932

- The schooner *Maude Thornhill* was missing with eight crewmembers aboard between Newfoundland and Nova Scotia (TJ)

PRINCE EDWARD ISLAND

September 19, 1932

- Fisherman lost in West Point (HH)
- Telephone service was out in the province (G)
- Roof of the Summerside Post Office blew off, damage of $50 (G)
- Large quantity of mackerel was washed ashore at Fifteen Point and fishermen were taking them away in cartloads (G)
- Damage to wharfs in Summerside (G)
- Boat destroyed after hitting a reef in Alberton harbour (HH)

September 20, 1932

- In Mount Edward, a large toboggan slide structure blew down (G)

NEW BRUNSWICK

September 19, 1932

- 61 km/h (33 knots) winds in Saint John (TJ)
- 75–95 km/h (44–52 knots) winds in Moncton (TJ)
- Fredericton was hit by a lightning and hail storm (TJ)
- Roads blocked by trees in many parts of New Brunswick (TJ)
- Telephone and telegraph wires down from Woodstock to Fredericton (TJ)
- Covered bridge destroyed in Dorchester (TJ)

September 20, 1932

- 15 boats destroyed at Perce (TJ)

QUEBEC

September 19, 1932

- Power outages, telephone and telegraph lines down in Quebec (MG)
- Part of a cliff on Laval University was washed away by the rain and fell into an abandoned factory in Quebec City (MG)
- Half a mile of railway tracked washed away near Temiscouta (MG)
- Bridge was carried away by a stream in St. Honore (MG)
- 12 barns destroyed in Sainte Catherine (MG)

September 20, 1932

- More then 100 fishing boats lost or destroyed by gale in Gaspe, boats valued between *$300* and *$500* each (TJ)
- At Perce, 4.5 m (15 ft) waves pounded the shoreline and 15 boats were destroyed (TJ)
- At Petit Cap a fishing wharf was destroyed (TJ)

September 24, 1932

- Damage to Quebec roads equals *$20,000* in L'Islet, Kamouraska, Riviere du Loup, Temiscouata and Rimouski counties (MG)

1932–6

Tropical Storm #6 originated in the Gulf of Mexico, north of Mexico's Yucatan Peninsula, on September 18, 1932. The storm tracked north, made landfall in Louisiana, entered the CHC Response Zone as a tropical depression on September 21st, and dissipated later than day over Pennsylvania. Maximum wind speeds recorded for this storm were 65 km/h (35 knots) and 37 km/h (20 knots) in the CHC Response Zone. This storm did not result in any damage in Canada.

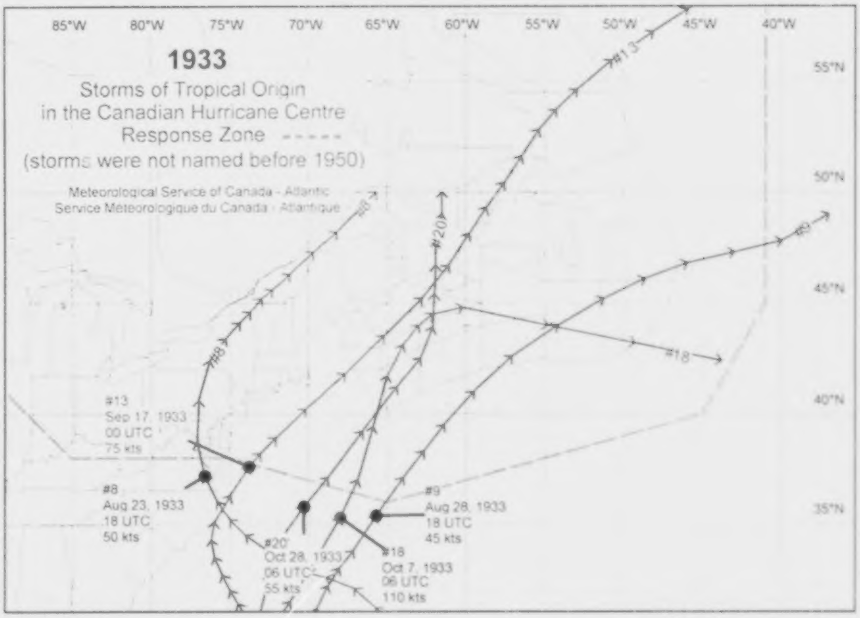
1932–9

Storm #9 began as a tropical storm east of the Greater Antilles on October 8, 1932. The storm curved to the northwest then to the northeast east of Bermuda and entered the CHC Response Zone on October 11th. On October 12th, the tropical storm dissipated southeast of Sable Island. Winds reached their maximum prior to entering the CHC Response Zone at 83 km/h (45 knots) and within the CHC Response Zone reached only 65 km/h (35 knots). No Canadian reports of damage were located for this storm.

1932–10

Storm #10 formed as a tropical storm east of the Lesser Antilles on October 30, 1932, tracked across the Caribbean as a hurricane, turned to the northeast before it reached Nicaragua, crossed Cuba and the Bahamas and entered the CHC Response Zone as a hurricane on October 13th. The storm weakened to a tropical storm before it exited the CHC Response Zone on October 14th. Maximum wind speeds recorded were 213 km/h (115 knots) and 111 km/h (60 knots) in the CHC Response Zone. Storm #10 merely grazed the southern portion of the CHC Response Zone and did not cause any damage in Canada.

1933 – MAP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1933
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
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Aug 28, 1933
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45 kts
#8
#13
#20
#9
#18

1933–8

Storm #8 made landfall over Quebec as a tropical depression with winds of 55 km/h (30 knots) on August 25th.

Storm #8 formed in the Atlantic Ocean east of the Lesser Antilles on August 17, 1933, before tracking to the northwest and landfalling in North Carolina. The tropical storm entered the CHC Response Zone on August 23rd and dissipated over the Gulf of St. Lawrence on August 26th. This hurricane recorded maximum wind speeds of 194 km/h (105 knots), 92 km/h (50 knots) inside the CHC Response Zone, and 55 km/h (30 knots) upon entry into Canadian territory. Many of the effects of the storm were a benefit to Canadian territory due to the dry summer, however, damage resulted to utility services and the storm delayed shipping and sailing schedules.

ONTARIO

August 25, 1933

- Lake Ontario reported wind speed 81 km/h (44 knots) (MG)

- Ontario vessel grounded near Summerville, NY, USA (MG)
- Brockville–falling branches damaged public utility service (MG)
- Caused water level to drop in the St. Lawrence Seaway halting operations (MG)
- Passenger boat service cancelled (MG)
- Rain welcomed by farmers in Ontario although delayed harvesting & threshing (MG)

QUEBEC

August 25, 1933

- Montreal–60 mm (2.4 in) of rain, wind 33 km/h (18 knots) on August 24, 1933 (MG)
- Mount Royal loses power–wires broken by strong wind (MG)
- Road tunnel flooded with between 1.0–1.3 m (3–4 ft) of water at Iberville Street and St. Joseph Boulevard (MG)

NEW BRUNSWICK

August 25, 1933

- Saint John–70 mm (2.7 in) of rain between 2:30–6:30 pm on August 24, 1933 (MG)

August 26, 1933

- Telegraph wires downed by falling power line between Moncton and Sussex (HH)
- Saint John–*Crawford Ellis* 10 hours late after battling storm (TJ)

August 29, 1933

- Fredericton–112 mm (4.4 in) of rain over weekend (TJ)
- Benefits experienced included protecting against forest fires and returning level of the Saint John River to normal levels after being the lowest in 15 years (TJ)

NOVA SCOTIA

August 25, 1933

- Benefits from storm: five hours of rain for dry crops and forest fires, replenished water supplies (Parrsboro, Oxford, Pictou) (HH)

August 26, 1933

- Halifax–50 mm (2 in) of rain (HH)
- Tree fell across communication wires near Shubenacadie (HH)

1933–9

Tropical storm #9 formed on August 24, 1933 east of the Greater Antilles, traveled northwest, turned to the northeast southwest of Bermuda, and entered the CHC Response Zone on August 28th. It entered Canadian waters as a 65 km/h (35 knot) tropical storm well south of Newfoundland in the early evening of August 29th, before exiting the CHC Response Zone on August 31st. Maximum wind speeds recorded for this storm were 83 km/h (45 knots) and these winds were recorded within the CHC Response Zone. No damage statistics were located in Canada for this storm.

1933–13 † (1 Canadian fatality)

Storm #13 made landfall near dawn on September 18th over Nova Scotia as a tropical storm with winds of 111 km/h (60 knots). Storm #13 also made landfall on September 19th over Newfoundland and then Labrador as a tropical storm with winds of 93 km/h (50 knots).

Storm #13 formed on September 9, 1933 east of the Lesser Antilles, tracked to the northwest, turned to the northeast after landfalling in North Carolina and entered the CHC Response Zone on September 17th, eventually dissipating south of Greenland on September 21st. The storm entered western marine areas as a marginal category one hurricane late on September 17 and made landfall in Nova Scotia about 10 hours later as a strong tropical storm with winds of 111 km/h (60 knots). Maximum wind speeds recorded for this storm were 194 km/h (105 knots), 130 km/h (70 knots) within the CHC Response Zone. Storm #13 brought heavy rainfall to southern New Brunswick resulting in flooding and damage. **One man was drowned in Nova Scotia, presumably because of the storm.**

NOVA SCOTIA

September 18, 1933

- Lockeport-one man presumed drowned in high seas when his dory found capsized after he failed to return home (HH)

September 19, 1933

- Yarmouth–27 mm (1.1 in) of rain–42 km/h (23 knots) wind (HH)
- Liverpool–one yacht lost (HH)
- Kentville–minor damage done to the apple crop (HH)
- *Donald II* ran ashore in Sydney (HH)

NEW BRUNSWICK

September 19, 1933

- 105 mm (4.1 in) in 14 hours in Fredericton (TJ)
- Gagetown–~ 75 mm (3 in) of rain in 15 hour period–damage to crops and orchards by heavy winds and roads temporarily flooded with water (TJ)
- Saint John–57 mm (2.3 in) of rain (HH)
- Harvey–washout delayed train delaying the mail from Saint John and the stream level rose rapidly (TJ)
- Harvey Station–one serious railway washout near Harvey Station railway tracks covered by 1 m (3 ft) of water–22–30 m (75–100 ft) of track washed out (HH)
- Fredericton–central Saint John River Valley damage extended for a 64 km (40 mi) radius and railways and highways suffered washouts (TJ)
- Nashwaak River recorded a 15 cm (6 in) rise (TJ)
- Boston/Montreal express five hours late (HH)

NEWFOUNDLAND

September 19, 1933

- Schooner *Armenia* lost off Perry's Cove (ET)

September 20, 1933

- Schooner *Guide* lost off Grey Islands (HH)

1933–18 † (9 Canadian fatalities)

Storm #18 formed in the Caribbean Ocean on October 1, 1933 north of Panama, travelled north across Cuba, turned northeast across the Bahamas, and entered the CHC Response Zone on October 7th, moving into southwestern marine areas later that afternoon as a category three hurricane with winds of 185 km/h (100 knots). The hurricane continued northeast until just short of landfall in Nova Scotia where it turned east-southeast and dissipated on October 9th. Maximum wind speeds recorded for this storm were 240 km/h (130 knots) and 203 km/h (110 knots) within the CHC Response Zone. Damage from this storm was estimated at ***$1 million*** with impacts in Nova Scotia, New Brunswick, and Newfoundland. Heavy rain caused extensive flooding in Nova Scotia, which damaged utility services and infrastructure. Much of the damage in New Brunswick was to boats along the coast and in Newfoundland was the result of flooding. **Nine men died when after their boats were located disabled and capsized.**

October 10, 1933

- Losses in New Brunswick, Nova Scotia, and Newfoundland ~ ***$1 million***–field crops, highways & bridges were damaged in all three provinces (TJ)

NOVA SCOTIA

October 7, 1933

- Halifax–90 mm (3.6 in) of rain in 24 hours (HH)
- Truro extensive damage due to storm (HH)
- Sydney hard hit by rains–no damage reported–halted all harvesting (HH)
- Halifax–roof of Pier 22 was hit by lightning in the storm and flooding occurred at many locations for example: corner of Inglis and Barrington streets, a lake 0.9 m (3 ft) deep and 1.2 m (4 ft) wide, of water formed a temporary lake under the Fairview railway bridge and held up traffic (HH)

October 9, 1933

- Schooner *Telic* reported man overboard (G)
- Halifax–250 mm (9.8 in) of rain over weekend (HH)
- Kentville–140 mm (5.5 in) of rain Friday to Sunday noon (HH)
- Amherst–55 mm (2.2 in) in 24 hours–105 mm (4.1 in) for the week–roads almost impassable (HH)
- Annapolis Valley–winds damage orchard's estimated losses between 25 and 40%–1/3 of unpicked crop lost, a loss of between 50,000 and 150,000 or 250,000 barrels of apples at a value placed between ***$250,000 and $375,000***, potatoes in danger of rotting (HH)
- Annapolis Valley–streams are swollen, threatening dikes and flooding roads and cellars–bridge at Coldbrook washed out (HH)
- Truro–roads to Lower Truro and Bible Hill flooded, and surrounding fields turned into temporary lakes–Salmon and North Rivers both overflowed their banks in low places (HH)
- Digby–roof blown off a barn, huge trees uprooted, and hydro and telephone systems down (HH)

- Parrsboro–a scow broke free of its moorings, drifted and ran aground, boat a total loss including its cargo lumber worth *$100,000* (HH)
- Yarmouth–trees blocked secondary roads delaying traffic, rural telephone and electricity was out of order, and along the coast wharves and breakwaters were damaged by the force of the wind and seas and small boats were sunk at their moorings (HH)
- Halifax–the Sackville River overflowed its banks and covered the rifle range, dam at Chocolate Lake overflowed, the highway near Chester under 1.8 m (6 ft) of water and at the Royal Nova Scotia Yacht Squadron a snipe class yacht broke its moorings and washed up on shore (HH)
- Beechville–highway underwater for 45–60 m (150–200 ft) (HH)
- Communication lines with Montreal, Boston and Saint John due to a tree falling across the lines near Amherst (HH)
- Great Village landmark ruined when a century-old dam crashed under the weight of swollen streams and destroyed a road bridge (HH)

October 10, 1933

- One man swept to his death from a motor vessel en route from Boston to Yarmouth (HH)
- Road between Kentville and Coldbrook closed as the Cornwallis River floods road with 1.0–1.6 m (3–5 ft) of water, Brooklyn Street also flooded (HH)
- Harvesting of the apple crop is delayed estimated that 12% (100,000 barrels) of the crop may be lost (HH)
- Annapolis Royal 'abiteau' weakened–cost to repair *$2,000* (HH)
- Bridgetown–electric service was down due to damage from falling trees (HH)
- Hantsport–road between bridge and town covered with water and damaged fences and debris floated in water covering the road (HH)
- *$250,000* in damage to Annapolis Valley apple orchards (TJ)
- Washouts on the Canadian Pacific Railway shoreline at Spruce Lake (TJ)

October 11, 1933

- Sable Island–a sail hastily fashioned from blankets on a boat disabled by the storm prevented it from drifting into the Sable Island bar (HH)

October 12, 1933

- Disabled, overturned schooner *Ena T. Parsons* spotted floating in the Boston to Yarmouth shipping lanes her crew of seven presumed dead (G)

NEW BRUNSWICK

October 9, 1933

- The schooner *Villian* ran ashore near the Royal Kennebecasis Yacht Club (TJ)

- Saint John–64 km/h (35 knots) winds (HH)
- Saint John–rainfall 55 mm (2.2 in)–59 km/h (32 knots) winds at Douglas Avenue station (TJ)
- Shediac–81 km/h (44 knots) winds and high seas caused damage to fishing boats and the waterfront area and tides (storm surge) inundated lowlands (TJ)
- Schooner from Parrsboro ashore at Lorneville a short distance from Saint John, presumed to be a total loss including its cargo of coal (TJ)
- Lorneville–schooner *Dorothy* destroyed on jagged shore, seven yachts ripped from their moorings and piled ashore, and 120 m (400 ft) of Canadian Pacific Railway shoreline railroad washed out (TJ)
- Saint John–communications and power was lost in some districts and trees were uprooted (TJ)
- *Kitty*, *Gracie M.*, and *Rena M.* were all damaged or ran ashore (TJ)

October 10, 1933

- Losses at the Royal Kennebecasis Yacht Club approximately *$1,000* (TJ)

NEWFOUNDLAND

October 9, 1933

- Area damages included: three bridges washed out; 15–18 m (50–60 ft) of road washed out in area; railway line 5.5 km (3.5 mi) east of Catalina underwater and sections of the track had been washed away; telegraph lines damaged; and poles washed out (ET)
- House in vicinity Sutton's Pond was inundated and Westcott family were trapped in their home (ET)
- Power station partially out of order (ET)
- The railway trestle at Port Union was damaged (ET)
- Various reports of fishing boats were prevented from going to sea because of the storm, big sea and gale reports (ET)
- Stranded steamer *Marsland* swept off a shoal near St. John's harbour entrance and disappeared out to sea (G)

October 10, 1933

- Road and bridge between Plate Coves washed away (ET)
- Two motor boats wrecked and the schooner *Kathleen* was driven ashore near Harbour Grace (ET)

1933–20

Storm #20 made landfall over Nova Scotia as a tropical storm with winds of 111 km/h (60 knots) on October 29th. Storm #20 also made landfall over Quebec as a tropical storm with winds of 92 km/h (50 knots) on October 30th.

Storm #20 formed east of the Bahamas on October 26, 1933, traveled northeast, and entered the CHC Response Zone on October 28th where it eventually dissipated in the Gulf of St. Lawrence on October 30th. The storm entered southwestern marine areas on the afternoon of October 28th as a 111 km/h (60 knot) tropical storm, and then maintained this strength as it made landfall in eastern Nova Scotia just after noon on October 29th. Maximum wind speeds recorded in the storm were 111 km/h (60 knots) recorded in the CHC Response Zone. Damage was reported in all three Maritime Provinces and included damage to utilities and infrastructure; boats grounded, set adrift, ruined, or delayed; and flooding of basements and roadways. One man was injured when a car struck him as the storm reduced visibility.

NOVA SCOTIA

October 30, 1933

- 83 km/h (45 knots) wind (HH)
- Rainfall 38 mm (1.4 in) in 24 hours (HH)
- A man was injured when he was hit by a car in the height of the rainstorm (HH)
- Two vessels set adrift, one tanker ran aground and a sailing yacht was sunk in the storm (TJ)
- Telegraph and telephone lines disabled around NS (TJ)
- Fallen trees blocked highways, broke windows and damaged property (TJ)
- Forced shipping into Halifax and Yarmouth harbours and swamped small boats along the coast (HH)
- Most impact felt in Halifax, Cumberland, Colchester, and Pictou Counties (HH)
- Worst damage to telephone lines between Truro and Londonderry (HH)
- Halifax–damages included: uprooted trees; downed telegraph and power lines; telephone and streetcar service disruptions when a tree fell across the tracks on Gottingen Street; A chimney smashed through a house on Creighton Street; a tree blocked the intersection of Bell Road and Sackville Street; and skylights and windows blown out around the peninsula and in some locations doors were blown entirely off their hinges (HH)
- Royal Yacht Squadron–yacht *Pinions* damaged (HH)
- Fairview–oil tanker–*Talaralite*–driven ashore (HH)
- Kempt Road–trees uprooted–one through roof at North Street (HH)

- Bedford–signs welcoming people to Halifax and advertising the Nova Scotian Hotel, Carleton, and Orpheous Theatre and a carriage house were blown down (HH)
- New Glasgow–highways were badly damaged by the storm particularly in hilly areas (HH)
- Pictou Landing–five boats torn from their moorings and badly damaged, two beyond all repair, and a house located near the wharf destroyed (HH)
- Lunenburg–roads washed out and cellars flooded (HH)
- Windsor–flooded highways and washouts (HH)
- Halfway River east of Hantsport flooded the Halifax to Yarmouth highway (HH)
- Yarmouth–fields, highways, and cellars flooded (HH)
- St. Margaret's Bay power knocked out (HH)
- Highway near Hantsport under 1.8 m (6 ft) of water, roadway near Windsor also flooded, and Cornwallis River flooded Somerset Road near Berwick in the Annapolis Valley (TJ)
- Annapolis Valley–slight damage to apple crop (TJ)
- Small bridges near Amherst swept away and water covered the surrounding marshes (TJ)

October 31, 1933

- Amherst–58 mm (2.3 in) of rainfall for the two-day period (HH)
- Lawrencetown–barrels of apples lost when water flooded fields and washed them into a river (HH)
- Belmont–trees uprooted–Belmont stream flooded past dams and dykes into surrounding marshes and lowlands (HH)
- Paradise–road across river under 1 m (3 ft) of water (HH)
- Upper Musquodoboit–roofs and telephone lines damaged interfering with electricity–farmlands submerged in areas (HH)
- Shubenacadie–trees blown over and telephone lines downed causing an interruption in communications (HH)
- Aylesford–roads damaged (HH)
- Amherst–Port Philip Bridge and McKim Bridge at Wallace were damaged and the River Philip overflowed covering the road (HH)

NEW BRUNSWICK

October 30, 1933

- Shediac–gales 57–64 km/h (31–35 knots)–high tide (storm surge) flooded inland areas (TJ)
- Between Moncton and Sackville, lowlands appeared to be creeks and the Memramcook and Fox Creek marshes were flooded to the roadway (TJ)

- Canadian National Railways near Moncton experienced many washouts, one at least 30 m (100 ft) in length and in some places as much as 4.5 m (15 ft) deep (TJ)

November 1, 1933

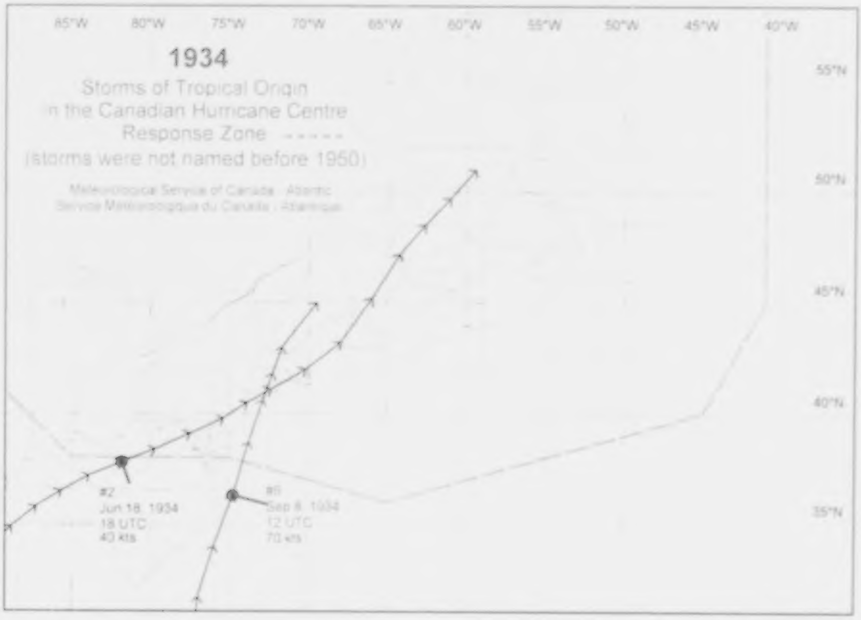
- *$100,000* damage to bridges and culverts in the southeastern section of the province (TJ)
- Affected Kent, Westmoreland, Albert, Kings and Queens Counties (TJ)
- Kent County–15 bridges destroyed and 27 damaged (TJ)
- Kings County–approximately 30 bridges damaged (TJ)

PRINCE EDWARD ISLAND

October 30, 1933

- Prince County–damage to telephone poles and trees, including two trees that fell across the road at Kelvin's Crossing near Borden blocking the road (G)
- Red Bridge over Dunk River near Ross Corner washed out (G)

1934 – MAP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1934
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2
Jun 18, 1934
18 UTC
40 kts
#6
Sep 8, 1934
12 UTC
70 kts

1934–2

Storm #2 made landfall over New Brunswick as a tropical storm with winds of 74 km/h (40 knots) on June 20th. Storm #2 made landfall over Quebec as a tropical storm with winds of 65 km/h (35 knots) on June 21st.

Developing on June 4, 1934 near Honduras, Storm #2 reached category one status at its maximum strength, however, as it entered the CHC Response Zone on June 18th, it was weakening into a tropical storm. The storm entered western marine areas on the morning of June 20th with winds of 74 km/h (40 knots), crossing New Brunswick later that day at the same strength. The storm eventually diminished on June 21st. The storm was the cause of power outages throughout Montreal, and flooding in Ontario.

ONTARIO

June 19, 1934

- Heavy rains delayed traffic in Oshawa (TS)
- A high tension wire broke at the corner of King Street and Simone Street (TS)

- Storm sewers were flooded and needed clearing on the main streets in the area (TS)

QUEBEC

June 22, 1934

- A wind and electrical storm blew through Montreal. It wreaked havoc in the rural districts (TS)
- Poles were blown down across the Canadian National Railway track from Sorel to Montreal (TS)
- The entire region between Sorel and Montreal was without power all night (TS)
- Three barns were destroyed by fire near Vercheres (TS)
- Eight more barns were destroyed in other areas of the province (TS)
- The lighthouse in Varennes was put out of commission (TS)

1934-6

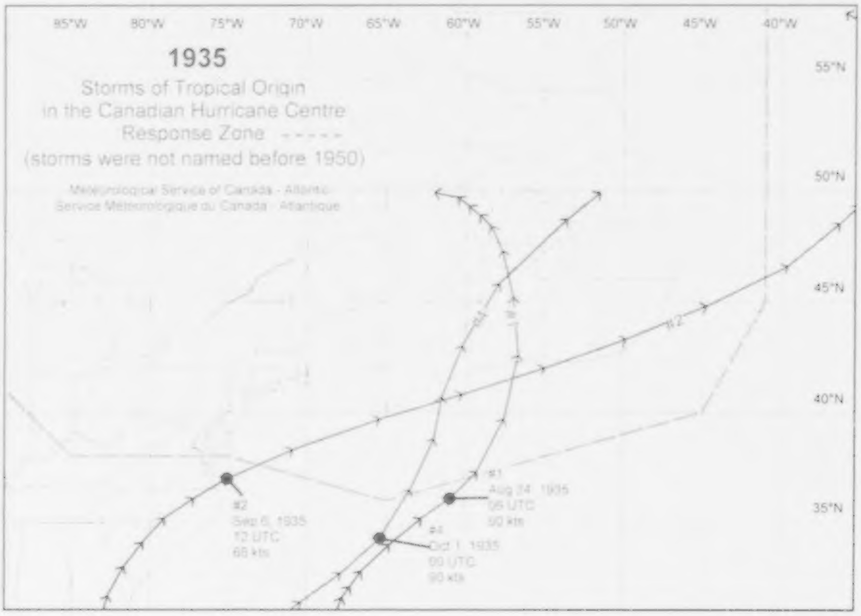
Developing east of the Bahamas on September 5, 1934, Storm #6 strengthened into a category two hurricane, bringing winds of 157 km/h (85 knots). It entered the CHC Response Zone on September 8th after weakening into a category one storm. With winds now at 129 km/h (70 knots) it caused large waves on Lake Ontario, which damaged a car ferry. The storm continued in the CHC Response Zone for one day before dissipating on September 9th.

ONTARIO

September 8, 1934

- Two people seriously hurt and 50 received minor injuries when a large wave broadsided a Canadian National Railway car ferry on Lake Ontario (TS)
- Passengers were hurled from their feet and furniture was shifted about (TS)
- Considerable damage was done to the ship (TS)
- Two bars on the ship were disabled when pipes were torn lose (TS)
- All passengers were from Rochester (TS)

1935 – MAP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1935
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#1
#2
#4
#2
Sep 6, 1935
12 UTC
65 kts
#1
Aug 24, 1935
06 UTC
90 kts
#4
Oct 1, 1935
00 UTC
90 kts

1935–1 † (34–49+ Canadian fatalities)

On the afternoon of August 25th, Storm #1 made landfall over southwestern Newfoundland with 120 km/h (65 knots) category one hurricane winds.

Storm #1 began east of the Greater Antilles on August 18, 1935 and formed into a category three hurricane with winds reaching 195 km/h (105 knots). Once entering the CHC Response Zone after dawn on August 24th, it entered southeastern waters as a 148 km/h (80 knot) hurricane in the early evening of the 24th and made landfall as a marginal category one hurricane over southwestern Newfoundland near noon on August 25th. Despite weakening this storm caused great damage to southwestern Newfoundland. The storm was reported to be the worst in 36 years. Many ships were damaged and many homes lost their roofs. **34–49+ people died on schooners off the coast of Newfoundland.** The storm dissipated on August 26th.

NEWFOUNDLAND

August 24, 1935

- The *Annie Young* lost at Fox Harbour with 8 crew (WOS)
- The *Geneva Ethel* had one man lost overboard at sea (TOS)

August 26, 1935

- Average velocity of 83 km/h (45 knots) for wind gusts in St. John's (ET)
- The schooner *Phylis West* went ashore, scores of fishing boats sunk, and roofing was torn away from many homes (TJ)
- A body was washed ashore at Halcove and was badly decomposed (TJ)
- Heavy damage to St. John's city property was reported (MG)
- Eight boats ashore at Renews (ET)
- The gale wrecked two planes being repaired in a hangar at an air force base (ET)

August 27, 1935

- The *Mary Bernice* capsized in Placentia Bay with 6 crew (ET)
- Six to nine crewmembers perished on the schooner *Annie Anita* (ET)
- Six perish on the schooner *Walter* off Trepassey (MG)
- Worst storm in 36 years (ET)
- *Thousands of dollars* in damage (ET)

August 28, 1935

- One crewmember was lost on the schooner *Senora DoSandi* while fishing in the Grand Banks (HH)
- One man washed overboard on the schooner *Beatrice Beck* (HH)
- The schooner *Helen Healy* was missing with six crew (HH)
- The damage on land was heaviest in the northeastern region of the island (MG)
- No estimate of damage yet to all the boats (MG)

August 29, 1935

- The Regional Ansty lost near Baie Verte with all crew (MG)

August 30, 1935

- One man washed overboard on the *James and Mary Hayden* (ET)
- The schooners *Carrie Evelyn* and *Carrie Evans* was lost with four crewmembers and all crewmembers respectively, at Fox Holes, Torbay (SNL)
- The schooner *Elsie J.* was missing with six crew (ET)

PRINCE EDWARD ISLAND

August 26, 1935

- 140 mm (5.6 in) of rain fell in Charlottetown in the past three days breaking the record from 1909 (G)

1935–2

Storm #2 developed east of the Bahamas on August 24, 1935. At its maximum strength, Storm #2 was a category five hurricane with winds of 260 km/h (140 knots). It entered the CHC Response Zone on September 6th as a category one hurricane with winds of 138 km/h (75 knots). The storm strengthened to 148 km/h (80 knots) by the time it entered the Grand Banks late on the morning of September 7. The hurricane remained well offshore of Canada and exited the CHC Response Zone on September 8th before dissipating on September 10th. The storm caused damage to the Annapolis Valley apple crop and damage to the pulpwood industry in Newfoundland.

NOVA SCOTIA

September 6, 1935

- 50 to 70 thousand barrels of apples lost in gale winds in Annapolis Valley (Kentville) with prices for barrels ranging from *$1.50 to $2.50* (HH)
- Actual loss was *$100,000* (HH)

September 7, 1935

- Bridgetown sustained heavy damage to crops and property (HH)

NEWFOUNDLAND

September 9, 1935

- Approximately 2,200 cords of pulpwood were lost during the storm creating a large loss for loggers (ET)

1935–4 † (1 Canadian fatality)

Storm #4 made landfall over Newfoundland as a tropical storm with winds of 111 km/h (60 knots) on October 2nd.

Storm #4 originated south of the Greater Antilles on September 23, 1935 and at one point was a category three hurricane with 195 km/h (105 knots) winds. It entered the CHC Response Zone as a category two hurricane, carrying winds of 157 km/h (85 knots). It had weakened to a 139 km/h (75 knot) hurricane when it entered southern waters and to a 111 km/h (60 knot) tropical storm by the time it made landfall on the south coast of Newfoundland near dawn on October 2nd. Several ships were damaged or in distress **while one man was believed to have drowned.** The storm later diminished on October 2nd.

NEWFOUNDLAND

October 2, 1935

- Average wind velocity of 57 km/h (31 knots) at Cape Race (ET)
- Torrential rains but no major damages reported (ET)
- No gales on the south and west coasts (ET)

October 3, 1935

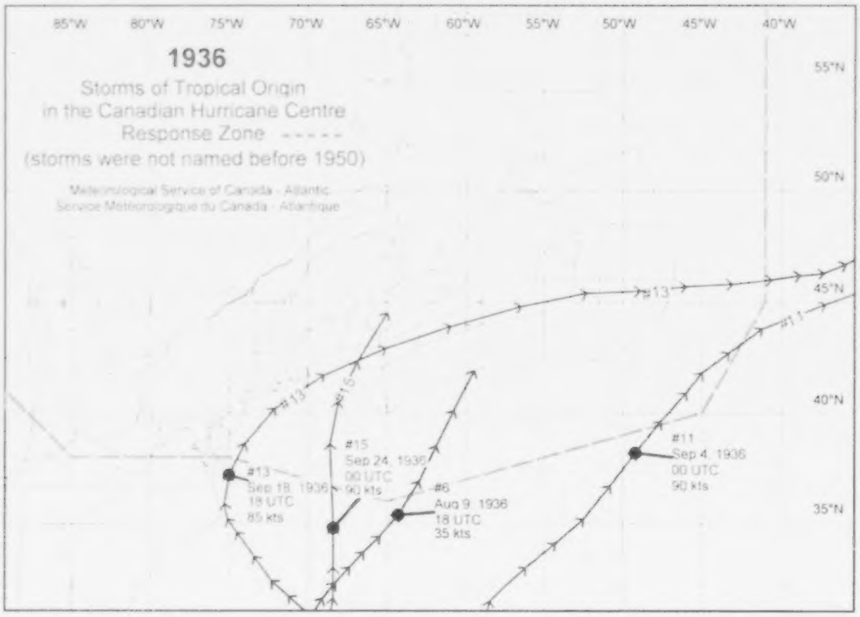
- One man is believed to have drown offshore of Halifax as his boat drifted to shore (TJ)
- A Portuguese schooner, *Rosita*, was in distress off Cape Race (G)
- The *Madeline Hebb* schooner makes it safely to port in St. Anthony (TJ)
- Four vessels are damaged heavily near St. Mary's (ET)

NOVA SCOTIA

October 2, 1935

- The United States yacht *Cumargo*, had to shelter in Halifax harbour from rising winds and seas (HH)

1936 – MAP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1936
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#13
#13
#13
Sep 18, 1936
18 UTC
85 kts
#15
#15
Sep 24, 1936
00 UTC
90 kts
#6
Aug 9, 1936
18 UTC
35 kts
#11
#11
Sep 4, 1936
00 UTC
90 kts

1936–6

Storm #6 began on August 4, 1936 near the Lesser Antilles and continued until August 10th. Only reaching tropical storm status, Storm #6 sustained winds as high as 74 km/h (40 knots). It entered the CHC Response Zone on August 9th and southern marine areas on August 10th prior to dissipating. No Canadian damage was reported from this storm.

1936–11

Storm #11 originated in the mid-Atlantic, halfway between the Cape Verde Island and the Lesser Antilles. Developing on August 28, 1936 it strengthened into a category two hurricane. Carrying maximum winds of 176 km/h (95 knots) and winds of 166 km/h (90 knots) in the CHC Response Zone, Storm #11 diminished on September 6th. Canada reported no impacts from this storm.

1936–13 † (5–6 Canadian fatalities)

Storm #13 began east of the Lesser Antilles on September 8, 1936 and developed into a category three hurricane. It sustained maximum winds of 194 km/h (105 knots). Upon entering the CHC Response Zone on September 18th, it moved into western Maritime waters as a strong category one hurricane (148 km/h - 80 knots) near noon on the 19th and passed south of Yarmouth and north of Sable Island. It then continued to track south of Newfoundland. Nova Scotia was hard hit by the storm. Trains were derailed, crops were destroyed, roads were washed away, and flooding was experienced throughout the province. **Five people were reported to have died during the storm and one person was missing.**

NOVA SCOTIA

September 21, 1936

- Floodwater at Wrights River Lake in Antigonish, where a young man drowned while swimming was flooded to twice its size (HH)
- 95 mm (3.8 in) of rain was reported to have fallen at Halifax Citadel and winds were 72 km/h (39 knots) (TJ)
- 180 mm (7 in) of rain were recorded during the storm (HH)
- The Canadian National Railway Yarmouth bound Halifax and Southwestern train was off it tracks at White Point Beach. The train went through Hunt's Point Bridge near Liverpool when the roadbed was washed away. One man suffered a broken back and a sprained ankle during the derailment (TJ)
- The train derailment at Hunts Point resulted in the locomotive leaving the rails and going down a steep hill. The cars and locomotive were piled up in a heap over the embankment. The passenger cars remained on the tracks. However, a refrigerator car along with a tank and freight car also went over the embankment (HH)
- In Kentville, a downpour caused a vehicle accident and injured three people. The driving rain causing reduced visibility, which was the cause of the accident (TJ)
- There was widespread property damage throughout the province (TJ)
- The Salmon River Bridge in Yarmouth was washed out (TJ)
- In Annapolis Valley, heavy rain caused *thousands of dollars* of damage to grain crops, but the apple crops were not affected (TJ)
- In Lockeport, the reservoir burst from the pressing waters and a 2.5 m (8 ft) torrent flowed down to the ocean. It destroyed an icehouse, a barn, and part of the highway, while carrying along trees and rocks (TJ)

- There were also several other accidents throughout the province, including six in the Halifax area (TJ)
- One ship had its steering damaged but was in no immediate danger 325 km (200 mi) east of Sable Island (TJ)
- The storm blocked Fairview railway subway, and prevented cars from entering the city (TJ)
- Dozens of cars became stalled in the lake formed by the water (TJ)
- Barns were swept away by landslides (HH)
- The brunt of the storm was felt along Shelburne, Yarmouth, Queens, Lunenburg, Halifax and the Clare section of Digby (HH)
- At Five River, 91 m (300 ft) of railway held up rescue crews as the tracks were washed out. A new piece of highway that was washed out here needed to be bridged (HH)
- In Liverpool, cellars and gardens were all flooded, while power and telephone communication was disrupted (HH)
- The road to Brooklyn was flooded and a garage in the town was also flooded (HH)
- Three washouts were reported from Mercey's River to Milton. 25 washouts were reported on the railroad between Halifax and Yarmouth (HH)
- Two sailboats were broken from there mooring and reported lost at Bridgewater (HH)
- In Shelburne, the roads between Jordan and Jordan Falls were flooded with approximately 1 m (3 ft) of water on the road (HH)
- One end of The Eastern Shipbuilding Corporations yacht shop was ripped off (HH)
- In Truro, flats were flooded while rivers and brooks overflowed the banks (HH)
- There were washouts in Kemptown and Lower Truro (HH)
- It was stated that the flooded farms would cause damage to the potato farms (HH)
- A bridge between Sable River and Wall's Corner near Lockeport needed to be replaced (HH)

September 22, 1936

- The boat containing the three Lunenburg men was found half submerged (TJ)
- Grain crops were damaged heavily in Cumberland (HH)
- In Hectanooga, the damage to apple crop was heavy (HH)
- The Salmon River Bridge and the Marillet Bridge were reported to have been carried away (HH)

NEWFOUNDLAND

September 21, 1936

- In Harbour Grace, 81 km/h (44 knots) gale caused two planes to delay takeoff (TJ)

September 22, 1936

- The body of one man from Newfoundland was washed ashore today. Another companion is feared to have drowned too. They left Ramea in a dory heading for Deer Island when the vessel apparently foundered (TJ)
- At Bay Bulls, two fishing stages were destroyed by heavy seas. One fisherman lost 3,000 kg (6,600 lbs) of codfish that was drying on a flake (ET)
- Two motor boats were destroyed at Bauline and another boat left its moorings and drifted to sea and never seen again (ET)
- The waves at Ferryland were reported to be passing over Goose Island (ET)

1936–15

Storm #15 tracked west of Bermuda and made landfall just south of Yarmouth, Nova Scotia as a category one hurricane with 140 km/h (75 knots) winds on September 25, 1936 at 0330 UTC.

Storm #15 originated on September 19, 1936 near the Lesser Antilles. It entered the CHC Response Zone on September 24th as a category two hurricane, with winds as high as 157 km/h (85 knots). It weakened to 140 km/h (75 knots) before entering western Maritime waters in the early evening of September 25th but then maintained that strength as it made landfall in southwestern Nova Scotia later that evening. The storm affected provinces from Ontario east with heavy rainfall induced flooding and damage to vessels.

ONTARIO

September 25, 1936

- 25 mm (1 in) of rain had fallen in the Ottawa area (MG)
- Extensive damage was caused to crops and subways and catch basins were flooded in Ottawa (MG)

NEWFOUNDLAND

September 26, 1936

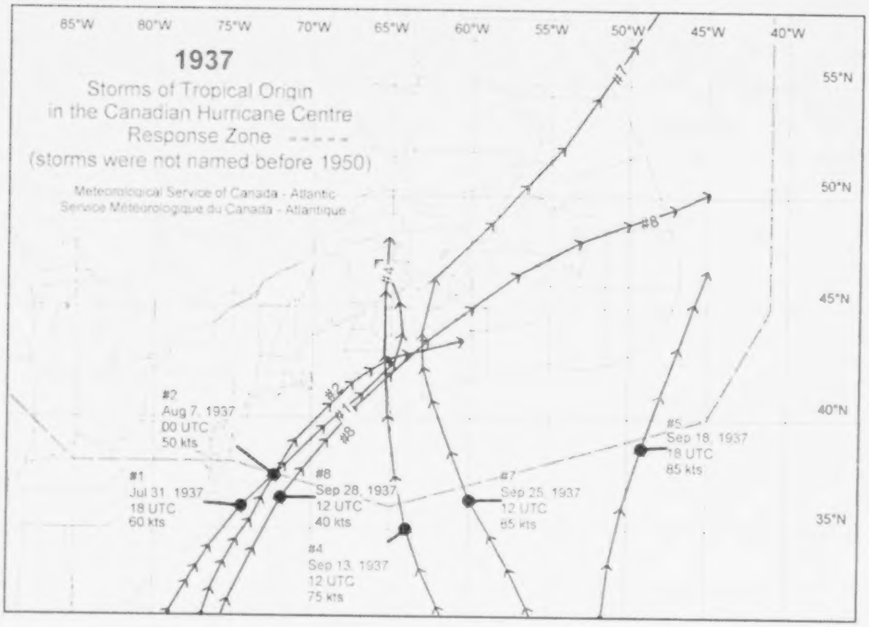
- Gale of easterly winds and a downpour hit St. John's through the night and the following day (ET)
- The seas were mountainous and raging against the coast at Logy Bay, Outer Cove, Middle Cove, Torbay and Flatrock (ET)
- In Torbay, about 12 boats were sunk (ET)
- In Flatrock, a motorboat was wrecked (ET)

NOVA SCOTIA

September 28, 1936

- Six Lunenburg fishermen survived the storm when their three massed ship *Village Queen* was pounded ashore at St. Mary's Cape. The ship went ashore in the storm and the crew were forced to jump overboard when the ship broke up on the rocks and cliffs (G)

1937 – MAP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1937
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#7
#8
#4
#2
#1
#8
#2
Aug 7, 1937
00 UTC
50 kts
#1
Jul 31, 1937
18 UTC
60 kts
#8
Sep 28, 1937
12 UTC
40 kts
#4
Sep 13, 1937
12 UTC
75 kts
#7
Sep 25, 1937
12 UTC
85 kts
#5
Sep 18, 1937
18 UTC
85 kts

1937–1

Storm #1 made landfall over Nova Scotia and New Brunswick as a tropical storm with winds of 74 km/h (40 knots) and 65 km/h (35 knots) respectively, on August 2nd.

Tropical Storm #1 formed west of Florida in the Gulf of Mexico on July 29, 1937. The storm entered the CHC Response Zone on July 31st, southwestern marine waters on August 1st and on August 2nd it made landfall in Nova Scotia as a 74 km/h (40 knot) tropical storm. Maximum wind speeds were recorded within the CHC Response Zone and they measured 111 km/h (60 knots). Utility services were disrupted in Nova Scotia and the rain helped control a forest fire that had been raging. Coastal communities in Nova Scotia and Prince Edward Island experienced damage to vessels.

NOVA SCOTIA

August 2, 1937

- 55 km/h (30 knots) winds in Halifax (G)

- 37 mm (1.5 in) of rain in 14 hours in Halifax according to the Citadel Hill Weather Observatory (G)
- Telephone and power disrupted in Halifax (HH)
- A forest fire was extinguished in Pictou County (HH)
- Three boats that were moored were destroyed and they were sent adrift in Halifax (HH)

PRINCE EDWARD ISLAND

August 3, 1937

- Damage to a boat in Charlottetown harbour (G)

1937–2

Originating in the Atlantic Ocean near the Bahamas, Tropical Storm #2 tracked northeast, entered the CHC Response Zone on August 6, 1937 and dissipated southwest of Sable Island. Maximum winds for this storm were 93 km/h (50 knots) and were recorded within the CHC Response Zone. No damage was reported in Canada due to this storm.

1937–4

Storm #4 made landfall in Nova Scotia and New Brunswick as a tropical storm with winds of 102 km/h (55 knots) on September 14th. Storm #4 then made landfall over Quebec on the same day as a tropical storm with winds of 65 km/h (35 knots).

Storm #4 began in the Atlantic Ocean east of the Lesser Antilles, transitioned to a hurricane tracking north and entered the CHC Response Zone on September 13, 1937. It remained a hurricane until it entered southern Maritime waters when it was downgraded to a tropical storm. The storm made landfall on September 14th as a 102 km/h (55 knot) tropical storm in Nova Scotia. Maximum strength of the storm was category two with wind speeds measuring 157 km/h (85 knots) and in the CHC Response Zone the maximum was 130 km/h (70 knots). The apple crop was damaged in the Annapolis Valley, and structural damage resulted in both Nova Scotia and New Brunswick from the storm.

NOVA SCOTIA

September 15, 1937

- 600,000 barrels of apples lost in Annapolis Valley (TJ)
- *$1.5 million* of damage done to the apple crops in Annapolis Valley (HH)
- Damaged homes and barns across Nova Scotia (TJ)
- Roof blew off home in Shelburne County (HH)
- Sections of buildings were torn off in Summerville (HH)
- Wharfs and a large boat were severely damaged in Shelburne (HH)
- An old willow tree 9 m (30 ft) in circumference was split in two in Shelburne (HH)
- Heavy damage to a schooner that ran ashore in Lockeport (HH)

NEW BRUNSWICK

September 15, 1937

- Damaged homes and barns across New Brunswick (TJ)

1937–5

Storm #5 began as a tropical storm east of the Lesser Antilles, tracked northwest and then northeast, and entered the CHC Response Zone as a hurricane on September 18, 1937. The hurricane travelled east of Newfoundland until it dissipated on September 19th. Maximum wind speeds reached 176 km/h (95 knots) prior to entering the CHC Response Zone and 157 km/h (85 knots) within the CHC Response Zone. This hurricane remained offshore of Canada, dissipated well east of Newfoundland, and caused no damage reported in Canada.

1937–7

South of Nova Scotia, Storm #7 turned to a northeast track and made landfall in Guysborough County on September 26th at 1430 UTC as an extratropical category one hurricane with 139 km/h (75 knots) winds. Storm #7 then proceeded over the

eastern tip of Prince Edward Island and Cape St. George, Newfoundland slightly weaker with winds of 130 km/h (70 knots).

Storm #7 originated in the Atlantic Ocean between the Cape Verde Islands and the Lesser Antilles on September 20, 1937. Initially a tropical storm, this storm rapidly intensified to a hurricane as it tracked northwest, entering southern Maritime waters late on September 25th and making landfall in Nova Scotia near noon on the 26th at a strength of 139 km/h (75 knots). Maximum winds in the CHC Response Zone were the highest recorded for this storm at 157 km/h (85 knots). This storm brought mostly coastal damage in Nova Scotia with damage to vessels, wharves, and breakwaters along with trees being uprooted around the province.

NOVA SCOTIA

September 27, 1937

- A breakwater near Devil's Island, Halifax was damaged (G)
- Vessels went ashore all along the Nova Scotia coast (G)
- Uprooted trees all over Nova Scotia (G)
- Damage to fishing gear across Nova Scotia (G)
- In Liverpool, a boat launch was destroyed, as well as racing ships and other boats (G)
- The breakwater in Brookland was also heavily damaged, it will cost *$80,000* to replace (G)
- Marine dredge was destroyed at Cape Negro (HH)
- Breakwater at Western Head was washed away (HH)
- A dredge and three scows sank somewhere between Lunenburg and Shelburne after their moorings broke away from the tug towing them to New Brunswick (TJ)

September 28, 1937

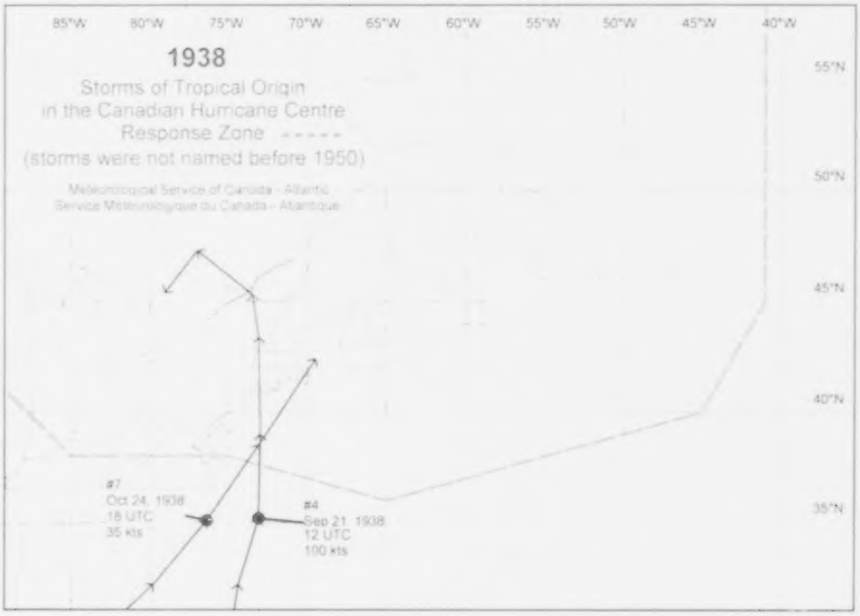
- Fishermen's buildings, wharves, lobster pots and nets destroyed in Port Bickerton (HH)
- Fish plant destroyed in Halifax (HH)
- Breakwater damaged in Yarmouth (HH)

1937–8

Storm #8 made landfall over Newfoundland as a tropical storm with winds of 65 km/h (35 knots) on September 30th.

Tropical Storm #8 began north of Cuba on September 26, 1937 curved northeast parallel to the eastern seaboard, and entered the CHC Response Zone on September 28th. The storm passed south of Nova Scotia as a post tropical storm on September 30th. The storm made landfall as a 65 km/h (35 knot) tropical storm on the south coast of Newfoundland on September 30th. Maximum winds recorded for this storm were 74 km/h (40 knots), observed inside the CHC Response Zone. No Canadian damage reports were located for this storm.

1938 – MAP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1938
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#7
Oct 24, 1938
18 UTC
35 kts
#4
Sep 21, 1938
12 UTC
100 kts

1938–4 † (1 Canadian fatality)

Storm #4 made landfall in New England and eventually near Montreal, Quebec early on September 22, 1938. Maximum winds were 130 km/h (70 knots) when this category one hurricane entered Quebec. Storm #4 also made landfall over Ontario on the same day as a tropical storm with winds of 65 km/h (35 knots).

Storm #4 reached category five hurricane strength with winds of 260 km/h (140 knots). It developed over the Cape Verde Islands on September 10, 1938. Upon entering the CHC Response Zone as a category three hurricane on September 21st, Storm #4 weakened considerably, however, it was still a marginal category one hurricane when it entered Quebec in the early morning hours of September 22nd. **One person was killed** and two others were injured during the storm in Montreal. The winds created power outages, uprooted trees, downed telephone lines, and blew off several roofs. The storm diminished September 22nd.

QUEBEC

September 22, 1938

- One death attributed to storm in Montreal; electrocution (MG)
- Over 50 mm (2.5 in) of rain fell in Montreal (MG)
- Two others were injured as well (MG)
- A wooden garage was blown away in Lachine (MG)
- Power outages in St. Jerome and practically every tree in the city was damaged (MG)
- Sherbrooke suffered high property damage as many roofs and trees were hit by the wind (MG)
- In Granby, a huge illuminated sign atop a three-story building at Main Street and Drummond Street, was wrenched from it's supports and hurled to the pavement below with a horrific crash (MG)

September 23, 1938

- Telephone lines were hard hit with only approximately 15% of the circuits still working between Toronto and Quebec (MG)
- Train services to New England were badly disrupted (MG)
- Rivers overflowed and flooded numerous houses in Portneuf and St. Hyacinthe (MG)
- Roofs of houses were blown off in these areas and trees were down everywhere (MG)

ONTARIO

September 22, 1938

- Smith Falls sustained 80 km/h (43 knots) winds and damage is estimated in the ***thousands of dollars*** (TS)

1938–7 † (4 Canadian fatalities)

Storm #7 originated in the Gulf of Mexico on October 23, 1938 and made tropical storm status. It travelled along the United States east coast before entering the CHC Response Zone on October 24th and then passing over the Bay of Fundy as an extratropical cyclone with winds of 65 km/h (35 knots). **Four men drowned after being washed overboard,** one man was injured in the storm after being hit by a car. There was telegraph lines down throughout Newfoundland and several other ships were damaged. The storm was only in the CHC Response Zone for one day before it dissipated on October 25th.

NOVA SCOTIA

October 25, 1938

- 11 mm (0.4 in) of rain fell in Halifax (HH)
- A man was hit by a car and injured in fog and drizzle on Cogswell Street in Halifax (HH)

October 26, 1938

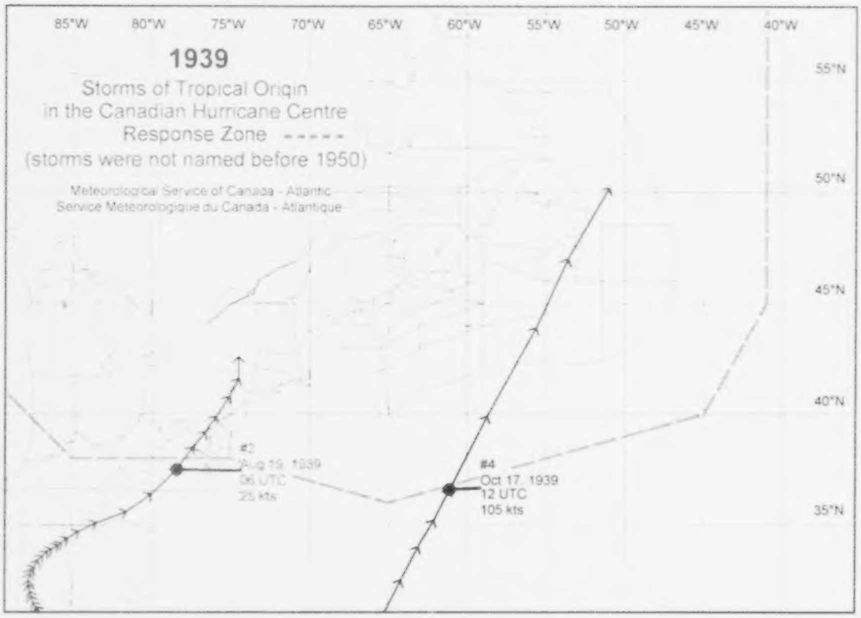
- 72 km/h (39 knots) gale struck coastal Nova Scotia (HH)
- Two schooners, the *Garfield* and the *Alfreda Keeping*, were badly damaged and the storm was declared to the worst since February 1932 (HH)
- Ferry services were cancelled, barns were blown down in Antigonish and a house was moved from its foundation in New Waterford (HH)

NEWFOUNDLAND

October 29, 1938

- Four men lost their lives at sea when they washed overboard on the *Tyee* off the west coast (ET)
- Damage to the breakwater at Sandy Point is estimated at *$5,000 to $7,000* (ET)
- Two vessels, the *Mavis P*. and the *Joseph M.*, went aground near Sandy Point (ET)
- All the telegraph lines are down and the roads are damaged to a great extent throughout the province (ET)

1939 – MAP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1939
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#2
Aug 19, 1939
06 UTC
25 kts
#4
Oct 17, 1939
12 UTC
105 kts

1939–2

Storm #2 originated in the Lesser Antilles on August 7, 1939. The storm developed into a category one hurricane at its maximum strength. It carried winds as high as 129 km/h (70 knots). Storm #2 entered the CHC Response Zone on August 19th as a tropical depression with winds of 46 km/h (25 knots) and diminished on August 20th. Canada experienced no damage from this storm.

1939–4 † (6 Canadian fatalities)

As storm #4 moved over the Avalon Peninsula of Newfoundland, it attained category one hurricane winds of 148 km/h (80 knots) on the morning of October 18th.

Storm #4 was discovered between the Greater and Lesser Antilles on October 12, 1939. The storm reached a maximum strength of a category four hurricane. At that point it was packing winds of 213 km/h (115 knots). Storm #4 was a category three hurricane with winds of 195 km/h (105 knots) when it entered the CHC Response Zone on October 17th, a category two hurricane as it entered Canadian waters in the early evening of October 17, and a category one hurricane of 148 km/h (80 knots) as it crossed the Avalon Peninsula of Newfoundland shortly after midnight on the 18th. Six people were killed during the storm, and 76 people were injured on board a ship. Several fishing vessels were also wrecked. The storm weakened even more at this point and dissipated on October 18th.

NEWFOUNDLAND

October 18, 1939

- Schooner *Nelson* was wrecked on Little Sacred Island with two crewmembers lost (WW)
- Distress calls from the *Blairbeg* steamship, 260 km (160 mi) off St. John's and the *President Harding*, 480 km (300 mi) off St. John's (ET)

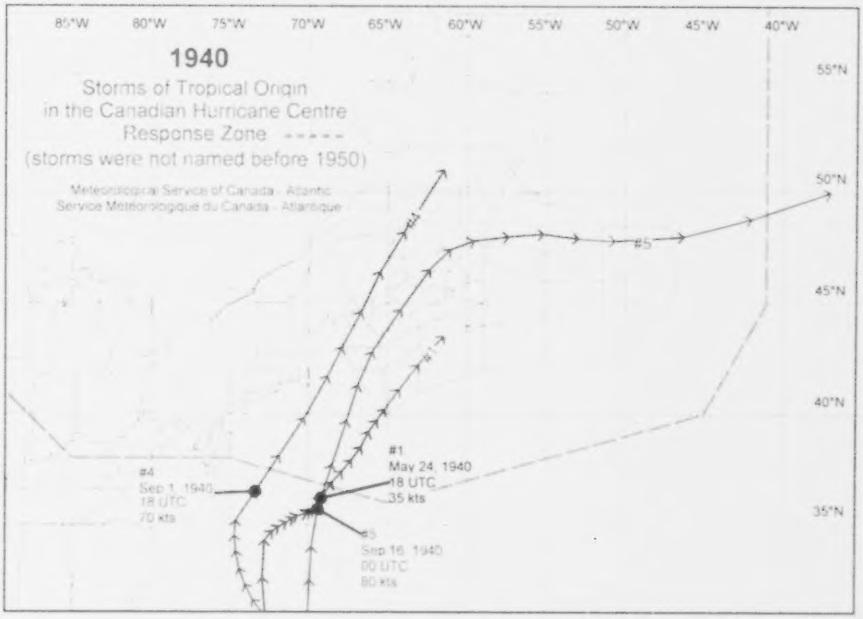
October 20, 1939

- Four drownings were reported following the gale; two lives were lost when a boat ran aground and another two people had their motor boat wrecked (ET)

October 21, 1939

- 76 people were injured on the *President Harding* ship out in storm (ET)
- Average wind speed of 65 km/h (35 knots) near St. John's (ET)
- During the evening, the barometer fell from 1009.1 mb to 961.7 mb (29.8 in to 28.4 in) (ET)
- Two fishing schooners reported a total loss due to damage after the storm (ET)
- One house was blown over in St. John's and all other damage was minor flooding (ET)

1940 – MAP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35°N
1940
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
#4
#5
#1
#4
Sep 1, 1940
18 UTC
70 kts
#1
May 24, 1940
18 UTC
35 kts
#5
Sep 16, 1940
00 UTC
80 kts

1940–1

Tropical Storm #1 formed in the Atlantic Ocean south of the Turks and Caicos on May 19, 1940. The storm tracked north until it was located east of North Carolina, then turned to the northeast and entered the CHC Response Zone on May 25th. The storm remained at marginal gale strength of 65 km/h (35 knots) as it entered Canadian waters May 26 and then weakened to a tropical depression and dissipated south of Nova Scotia on May 27th. Maximum wind speeds observed in the storm were 92 km/h (50 knots) but only 65 km/h (35 knots) in the CHC Response Zone. No damage was reported in Canada related to this storm.

1940–4

Storm #4 made landfall in New Brunswick and Quebec as a tropical storm with winds of 102 km/h (55 knots) and 65 km/h (35 knots) respectively, on September 3rd.

Storm #4 formed in the Atlantic Ocean east of Florida on August 30, 1940, headed northwest, intensified to hurricane strength, turned to the northeast off North Carolina, and entered the CHC Response Zone on September 2nd. The storm tracked over the Gulf of Maine and entered Canadian waters via the Bay of Fundy late on September 2nd as a 130 km/h (70 knot) hurricane. However, it quickly weakened to a tropical storm of 102 km/h (55 knots) by the time it made landfall late on September 2nd. Vessels experienced damage in southern Nova Scotia and one man was injured in a car accident during the storm in New Brunswick.

Nova Scotia

September 3, 1940

- Motorboat ran aground near Big Tusket Island (TJ)
- Six yachts were capsized on Lake Milo in Yarmouth (TJ)
- One small yacht was overturned in Shelburne (TJ)

New Brunswick

September 3, 1940

- Man injured in car accident during storm on the highway near Barnesville (TJ)

1940–5 † (1+ Canadian fatalities)

Around midnight September 16-17, this category one hurricane made landfall in Nova Scotia near Lockeport with wind speeds of 120 km/h (65 knots). Storm #5 made landfall over Prince Edward Island the same day as a tropical storm with winds of 102 km/h (55 knots), and then over Newfoundland on September 18th, as a tropical storm with winds of 74 km/h (40 knots).

Storm #5 originated in the Atlantic Ocean east of the Lesser Antilles on September 10, 1940. The storm tracked northwest towards the Bahamas, turned to the north as it intensified to hurricane strength, and entered the CHC Response Zone on September 16th, moving into Canadian waters about 4:00 p.m. ADT as a 130 km/h (70-knot) hurricane. Maximum winds observed in this storm were 157 km/h (85 knots) and 139 km/h (75 knots) in the CHC Response Zone. The storm made landfall near Lockeport Nova Scotia as a marginal category 1 hurricane then subsequenctly weakened to tropical storm strength as it crossed Nova Scotia, Prince Edward Island, and Newfoundland. It departed Newfoundland as a post tropical depression, and exited the CHC Response Zone on September 19th. In New Brunswick, eight people were injured in an automobile accident related to the storm and **one man was missing in Bathurst.** Around the Maritimes, reports included structural damage and uprooted trees. In New Brunswick and Nova Scotia, there was also flooding, higher tides, coastal damage to infrastructure and vessels, and damaged utilities; and in Nova Scotia there was much damage to the apple crop.

September 17, 1940

- 75 km/h (44 knots) winds in Maritimes (TJ)
- Many trees, chimneys and fences blew down across the Maritimes (TJ)

NOVA SCOTIA

September 17, 1940

- 75 mm (3 in) of rain in Halifax (HH)
- Tides were 1.3 m (4 ft) higher then normal high tides (HH)
- Power outages, telephone and telegraph services down across Nova Scotia (TJ)
- Two yachts damaged in Halifax (TJ)
- Five buildings caught fire in Halifax from damaged wires (HH)
- Tree fell into a home at Melville Cove, damaging the roof (HH)

September 18, 1940

- 95 km/h (52 knots) winds in Yarmouth (HH)
- 113 km/h (60 knots) winds in Lockeport (HH)
- 90 mm (3.5 in) of rain in 24 hours in Yarmouth (HH)
- 600,000 barrels of apple lost in Annapolis Valley, equalling ***$1.5 million*** in damage (HH)
- Heavy loss of grain crops in Cumberland County (HH)
- Grain and corn crops damaged in Digby County (HH)
- Many small buildings blew over in Nova Scotia (HH)
- High tides made Lockeport a temporary island (HH)
- One home flooded in Lockeport (HH)
- A breakwater was destroyed at Sandy Point in Shelburne (HH)
- In Jordon Bay, two boat houses and a barn were toppled over and a wharf washed away (HH)
- 10 boats in Lake Milo in Yarmouth, were extensively damaged (HH)
- A schooner damaged a wharf in Bridgewater (HH)
- One boat in East Ferry, Digby County was destroyed (HH)
- A barn and farm equipment was destroyed in Pembroke (HH)
- Cabins were heavily damaged in Summerville (HH)
- A garage at Lour Lodge in Digby was destroyed (HH)

- Several trees blew over in Nova Scotia (TJ)
- A bus from Halifax to Yarmouth ran into a ditch and was not able to be removed for some time (HH)

NEW BRUNSWICK

September 17, 1940

- Power outages, telephone and telegraph services down across New Brunswick (TJ)
- Eight people injured in a car accident blamed on the storm (TJ)
- Several boats in Rothesay and Westfield lost (TJ)
- Chimneys blown down all over Saint John (TJ)

September 18, 1940

- Two groups of lobster fisherman missing in the Northumberland Straight (TJ)
- 130–140 km/h (70–74 knots) winds at the Lakeburn Airport (TJ)
- Grain and apple crops destroyed in Gagetown, Sunbury County (TJ)
- Hundreds of boats in the Northumberland straight were set adrift or sunk (TJ)
- Thousands of lobster traps destroyed and wharfs damaged across the Northumberland Strait (TJ)
- Wharf in Shediac washed away (TJ)
- 50 boats in Cape Bald were sunk (TJ)
- Man in Dixon Point lost *$1,000* worth of live lobsters (TJ)
- In Port Greville, in the Bay of Fundy, four scows were destroyed (TJ)
- Ground floor of a house was flooded, the family of five required rescuing (TJ)
- Many tents were destroyed at the Sussex Military camp (TJ)
- Damaged bridges in Little River and Cocagne (TJ)
- Dykes in Baie Verte area damaged, costing ***thousands of dollars*** (TJ)
- A tree fell into the Gagetown United Church and caused considerable damage (TJ)
- Several trees blew over in New Brunswick (TJ)

September 19, 1940

- One man missing in Bathurst (TJ)
- Millstream River bridge was 0.9 m (3 ft) under water (TJ)

September 20, 1940

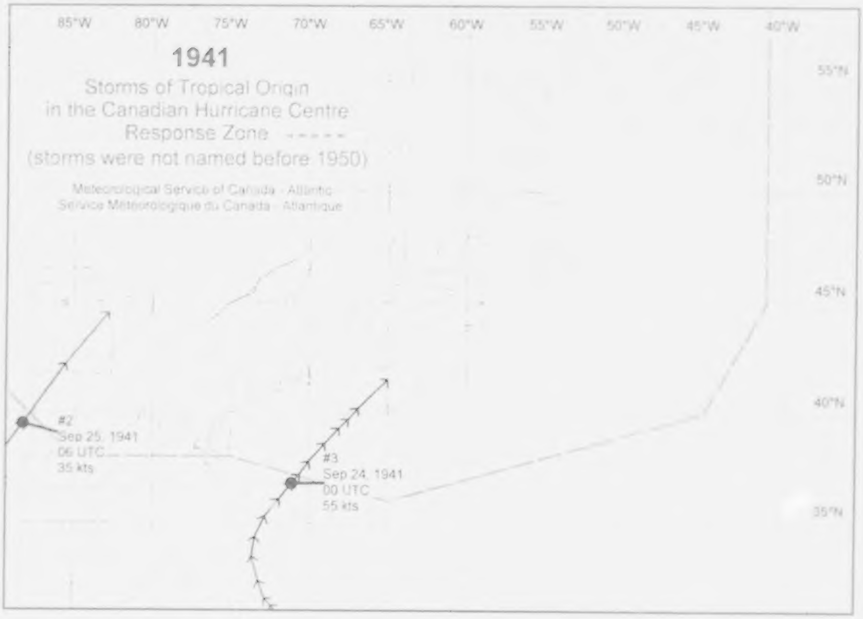
- Five fisherman found alive after battling with the hurricane for three days (TJ)

PRINCE EDWARD ISLAND

September 17, 1940

- No major damage in the province (TJ)

1941 – MAP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1941
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2
Sep 25, 1941
06 UTC
35 kts
#3
Sep 24, 1941
00 UTC
55 kts

1941–2 † (3 Canadian fatalities)

Storm #2 formed on September 16, 1941 in the Gulf of Mexico west of Florida. The storm looped around in the Gulf of Mexico, intensified, headed northwest, and made landfall in Texas. After landfall, Storm #2 turned northeast, weakened to a tropical storm, tracked through the American Midwest, transitioned to a post tropical storm, entered the CHC Response Zone on September 25th, and dissipated later that day over Lake Huron. Maximum wind speeds identified for this storm were 148 km/h (80 knots) and 56 km/h (30 knots) in the CHC Response Zone. **Ontario was impacted by this storm as three people died and others were injured;** boats and infrastructure were damaged around southern Ontario.

ONTARIO

- London reported winds of 80 km/h (43 knots) (MTB)

September 26, 1941

- Three people died and many were injured in Toronto (TJ)
- 120 km/h (65 knots) winds on Lake Ontario (TS)

- 12 m (40 ft) waves on Lake Ontario (TS)
- *Thousands of dollars* of damage in Toronto (TJ)
- Power outages across Ontario (TJ)
- 41 pleasure boats were destroyed and 14 bulk carriers were damage on Lake Ontario (TS)
- *Tens of thousands of dollars* lost in boats alone on Lake Ontario (TS)
- Boats at the yacht clubs on Bathurst Street in Toronto were damaged (TS)
- Two airplanes damaged in Barker field (TS)
- The main factory of the Ontario Refractories Limited was destroyed with damage of *$50,000* (TS)
- Flights were cancelled out of Toronto (TS)
- 18 boats sunk and 17 were damaged at the National and Alexandra Clubs in Toronto (TS)
- Extensive damage to crops and wheat fields in Ontario (TS)

QUEBEC

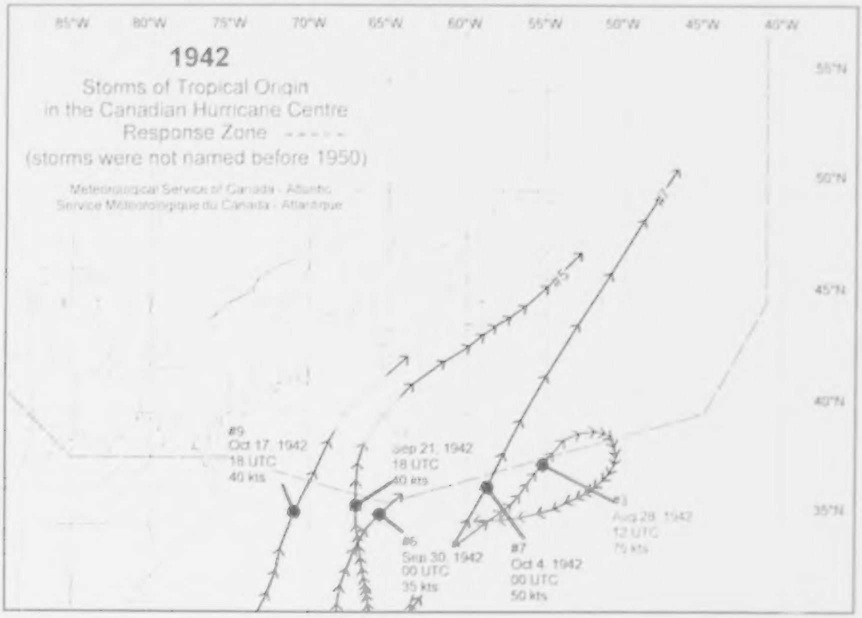
September 27, 1941

- 105 km/h (57 knots) winds in Montreal (MG)

1941–3

Storm #3 began in the Atlantic Ocean east of Florida, north of the Bahamas, on September 18, 1941. The storm intensified as it headed east before it looped around to the northwest, and turned to the northeast after weakening again to a tropical storm. On September 24th, Storm #3 entered the CHC Response Zone, tracked northeast, and entered Canadian waters on the 25th as a marginal tropical storm with winds 65 km/h (35 knots). It dissipated later that day south of Nova Scotia. Wind speeds reached a maximum of 130 km/h (70 knots), although in the CHC Response Zone the maximum winds recorded were 102 km/h (55 knots). This storm remained offshore in the CHC Response Zone and did not impact land.

1942 – MAP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35°N
1942
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#7
#5
#9
Oct 17, 1942
18 UTC
40 kts
Sep 21, 1942
18 UTC
40 kts
#6
Sep 30, 1942
00 UTC
35 kts
#7
Oct 4, 1942
00 UTC
50 kts
#3
Aug 28, 1942
12 UTC
75 kts

1942–3

Storm #3 began on August 25, 1942 southeast of Bermuda. The storm developed into a category two hurricane and contained winds of 176 km/h (95 knots). Storm #3 entered the CHC Response Zone on August 28th when it had weakened into a category one hurricane. Within the CHC Response Zone, it carried winds of 138 km/h (75 knots). Storm #3 left the CHC Response Zone on August 30th and diminished on September 2nd. No damage related to this storm was reported in Canada.

1942–5

Storm #5 made landfall over Newfoundland as a tropical storm with winds of 65 km/h (35 knots) on September 24th.

Storm #5 developed southwest of Bermuda on September 18, 1942 and only developed into a tropical storm. The system carried winds of 83 km/h (45 knots) at its maximum strength and winds of 64 km/h (35 knots) within the CHC Response Zone after entering Canadian waters on the afternoon of September 22nd. On September 24th the storm made landfall on the Avalon Peninsula of Newfoundland with winds of 65 km/h (35 knots). Storm #5 lasted for four days in the CHC Response Zone before it dissipated on September 25th. Canada was not impacted by this storm.

1942–6

On September 27, 1942, Storm #6 developed southeast of Bermuda. The storm only reached tropical status and contained winds of 83 km/h (45 knots). Storm #6 entered the CHC Response Zone on September 30th when it had weakened into a tropical depression. Within the CHC Response Zone, it only brought winds of 55 km/h (30 knots). The storm dissipated shortly after entering the CHC Response Zone on September 30th. Canada was not impacted by this storm.

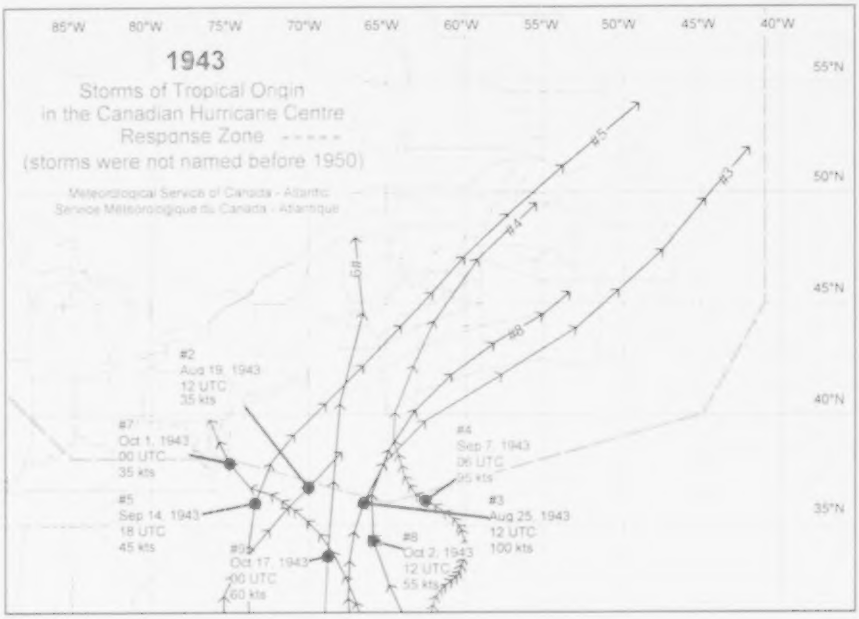
1942–7

Storm #7 originated north of the Greater Antilles on October 1, 1942. The storm only reached tropical storm status and contained winds of 92 km/h (50 knots) at its maximum strength. It entered the CHC Response Zone on October 4th and brought winds of 83 km/h (40 knots) as it moved through southeastern Newfoundland waters October 4-5. Storm #7 dissipated on October 5th. Canada reported no damage from this storm.

1942–9

Storm #9 began on October 13, 1942 and developed into a tropical storm just off the Cuban coastline. The storm contained winds of 83 km/h (45 knots) at its maximum strength and winds of 74 km/h (40 knots) in the CHC Response Zone. Winds remained at marginal tropical storm strength of 65 km/h (35 knots) as it entered southwestern Maritime waters on the morning of October 18th. The storm dissipated later that same day and did not impact Canadian territory.

1943 – MAP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40°N
35°N
1943
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#5
#3
#4
#9
#8
#2
Aug 19, 1943
12 UTC
35 kts
#7
Oct 1, 1943
00 UTC
35 kts
#5
Sep 14, 1943
18 UTC
45 kts
#9
Oct 17, 1943
00 UTC
60 kts
#4
Sep 7, 1943
06 UTC
95 kts
#3
Aug 25, 1943
12 UTC
100 kts
#8
Oct 2, 1943
12 UTC
55 kts

1943–2

Tropical Storm #2 formed in the Atlantic Ocean east of the Lesser Antilles on August 13, 1943, tracked northwest, turned to the northeast east of South Carolina, entered the CHC Response Zone on August 19th, and dissipated just inside the CHC Response Zone later on the 19th. Maximum winds for this storm were measured at 93 km/h (50 knots), and in the CHC Response Zone at 56 km/h (30 knots). This storm remained well south of Canada's marine area and did not impact land.

1943–3

On August 19, 1943, Storm #3 formed in the Atlantic Ocean east of the Lesser Antilles. The storm strengthened to a hurricane, tracked to the northwest, curved around Bermuda, headed to the northeast, and entered the CHC Response Zone on August 25th. The storm entered Canadian waters as a marginal hurricane before dawn on August 26th. It then tracked parallel to land as it passed south of Nova Scotia and Newfoundland, and transitioned to a post tropical storm prior to dissipating near the CHC Response Zone boundary on August 27th. Storm #3 reached category four in strength with wind speeds of 222 km/h (120 knots); however, in the CHC Response Zone the maximum wind speed recorded was 167 km/h (90 knots). This storm did not impact land.

1943–4

Storm #4 made landfall over Nova Scotia and Newfoundland as a tropical storm with winds of 111 km/h (60 knots) and 102 km/h (55 knots) respectively, on September 9th.

Storm #4 formed on September 1, 1943 east of the Bahamas in the Atlantic Ocean, tracked generally northwards, and entered the CHC Response Zone on September 8th. Late evening on the 8th it entered Canadian waters as a 139 km/h (75-knot) hurricane, but was downgraded to a tropical storm on September 9th before making landfall in Cape Breton around noon. The storm dissipated on September 10th. Maximum wind speeds recorded for this storm were 195 km/h (105 knots) and 176 km/h (95 knots) in the CHC Response Zone. No damage in Canada was attributed to this storm.

1943–5

Storm #5 made landfall over Nova Scotia and Newfoundland as a tropical storm with winds of 74 km/h (40 knots) and 65 km/h (35 knots) respectively, on September 16th.

Storm #5 began east of Florida in the Atlantic Ocean on September 13, 1943. The tropical storm tracked northwards, entered the CHC Response Zone on September 15th, moving into Canadian waters shortly after noon. It then turned northeast and transitioned to an extratropical storm, ultimately dissipating on September 17th . . . but not before making landfall as a 74 km/h (40-knot) tropical storm just east of Halifax shortly before midnight on the 15th. Maximum wind speeds reached 83 km/h (45 knots) and winds of this speed were recorded inside the CHC Response Zone. No damage was reported in Canada due to this storm.

NOVA SCOTIA

September 16, 1943

- 50–65 km/h (26–35 knots) winds and 30 mm (1.2 in) of rain in Nova Scotia (HH)

1943–7

Tropical Storm #7 began in the Atlantic Ocean south of Bermuda on September 28, 1943, tracked northwest, entered the CHC Response Zone on October 1st, made landfall in Maryland, crossed Delaware, and dissipated over Pennsylvania on October 1st. Wind speeds reached a maximum of 93 km/h (50 knots) and 65 km/h (35 knots) in the CHC Response Zone. This storm barely entered the CHC Response Zone and did not impact Canada.

1943–8

On October 1, 1943, Storm #8 began in the Atlantic Ocean east of the Bahamas. This tropical storm curved to the northwest over Bermuda then to the northeast, entered the CHC Response Zone on October 2nd, entered Canadian waters near dawn on Oct 3rd at a strength of 83 km/h (45 knots), then tracked parallel to Nova Scotia and dissipated south of Newfoundland on October 4th. Maximum wind speeds recorded for this storm were 111 km/h (60 knots); 102 km/h (55 knots) in the CHC Response Zone. Storm #8 remained south of land and did not impact Canada.

1943–9

Storm #9 made landfall over New Brunswick and Quebec as a tropical storm with winds of 65 km/h (35 knots) on October 17th.

Storm #9 originated in the western Atlantic Ocean near the Barbados on October 11, 1943. The storm tracked west across the Lesser Antilles, strengthened to a hurricane, turned north, and entered the CHC Response Zone as a tropical storm on October 17th.

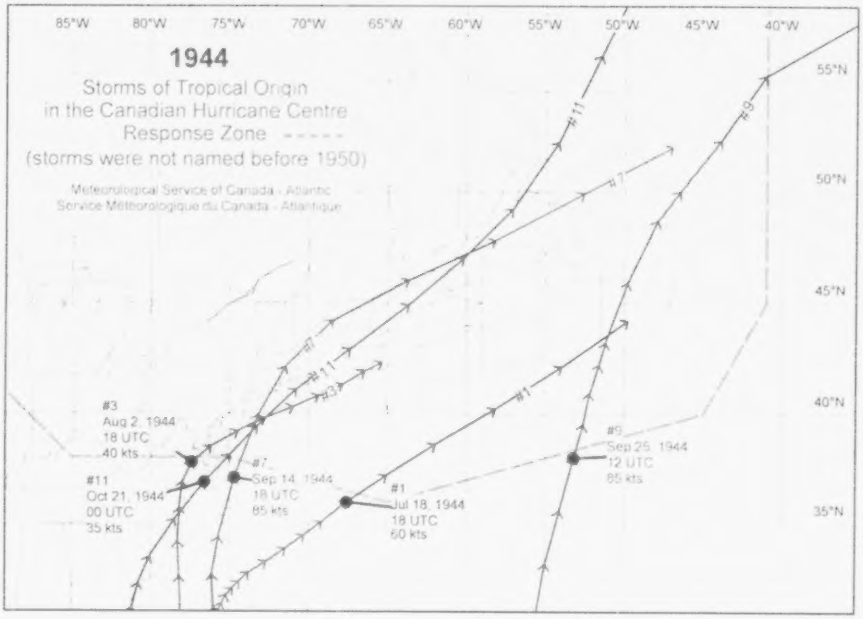
moving into Canadian waters at a strength of 74 km/h (40 knots) before noon and making landfall in New Brunswick that afternoon as a marginal tropical storm. The storm dissipated at the Quebec border on October 18th. Maximum wind speeds for this storm were 176 km/h (95 knots) and 84 km/h (45 knots) within the CHC Response Zone. This storm resulted in damage to utilities, crops, and several sections of railway.

NOVA SCOTIA

October 18, 1943

- 110 km/h (60 knots) winds in Nova Scotia (HH)
- 60 m (200 ft) of a railway was washed out in Shelburne and some damage to the railway lines in Lockeport (HH)
- *$300,000* of damage to the apple crop in Annapolis Valley (HH)
- Liverpool and Annapolis Valley were without power (HH)
- Telephone service in Halifax was out (HH)
- A barge broke away from the side of a ship in Halifax and went aground on Georges Island (HH)

1944 – MAP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1944
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#3
Aug 2, 1944
18 UTC
40 kts
#11
Oct 21, 1944
00 UTC
35 kts
#7
Sep 14, 1944
18 UTC
85 kts
#1
Jul 18, 1944
18 UTC
60 kts
#9
Sep 25, 1944
12 UTC
85 kts
#1
#3
#7
#9
#11

1944–1

Storm #1 began east of the Dominican Republic in the Atlantic Ocean on July 13, 1944. The tropical storm tracked northwest, strengthened to a hurricane, turned to the northeast, entered the CHC Response Zone on July 18th just after having transitioned to a post tropical storm. The storm entered Canadian waters on the afternoon of the 19th with winds of 93 km/h (50 knots) and eventually dissipated south of Newfoundland on July 20th. Maximum wind speeds for this storm were 148 km/h (80 knots) and in the CHC Response Zone they were 111 km/h (60 knots). Storm #1 remained offshore and did not impact Canada.

1944–3

On July 10, 1944, Storm #3 formed east of the Bahamas, tracked northwest, made landfall in North Carolina, entered the CHC Response Zone on August 2nd as a tropical storm, and dissipated south of Nova Scotia on August 4th . . . but not before entering Canadian waters as a marginal tropical storm on the morning of August 4th. Wind speeds reached a maximum of 148 km/h (80 knots), but in the CHC Response Zone the maximum was 74 km/h (40 knots). This storm resulted in structural damage in New Brunswick and the injury of three people.

NEW BRUNSWICK

August 5, 1944

- Three people injured at Bouctouche (TJ)
- Roof of a sawing shed blew off in Bathurst (TJ)
- Dog was killed by lightning in East Bathurst (TJ)
- Barns and farm equipment destroyed in Chatham, damage was *$5,000* (TJ)

1944–7 † (1 Canadian fatality)

Storm #7 made landfall in New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland as a tropical storm with winds of 65 km/h (35 knots) on September 15th.

Storm #7 originated as a hurricane east of the Greater Antilles in the Atlantic Ocean on September 9, 1944. The storm began tracking to the northwest, but curved to the northeast narrowly missing North Carolina, entered the CHC Response Zone as a hurricane on September 15th, and made landfall for the first time in New York. The storm transitioned to a post tropical storm before tracking up the Bay of Fundy, making landfall at the head of the Bay shortly after noon on the 15th. It eventually dissipated offshore of Newfoundland on September 16th. Storm #7 was a major hurricane with wind speeds recorded at 222 km/h (120 knots), although within the CHC Response Zone the maximum wind speeds were 139 km/h (75 knots). **One man died as a downed wire in Nova Scotia electrocuted him.** The storm resulted in damaged utilities in Nova Scotia, New Brunswick, and Prince Edward Island. Structural and crop damage occurred, as did flooding, coastal damage, and ferry delays in all four Atlantic Provinces.

NOVA SCOTIA

September 15, 1944

- Power outages in Halifax (HH)
- Several houses damaged and trees uprooted in Halifax (HH)

- Tree destroyed a garage on Agricola Street, Halifax (HH)
- House damaged by a falling tree on the corner of Lucknow and Victoria Street in Halifax (HH)

September 16, 1944

- 65 km/h (35 knots) winds in Annapolis Valley, 95 km/h (52 knots) winds at Debert and Yarmouth (HH)
- *$600,000* damage to apple crops in Annapolis Valley (HH)
- Power outages and lost of telephone services in Yarmouth, Shelburne, Digby, Truro, and Mahone Bay (HH)
- In Waterford, a home was damaged by large falling trees (HH)
- No ferry from Saint John to Digby (HH)
- A large tree in Victoria Square split in two and was thrown across a parked car in Truro (HH)
- The breakwater and a few boats were damaged in Kelly's Cove near Yarmouth (HH)
- An old building (Ryerson's Wharf) was partially crumbled in Yarmouth (HH)
- In Lunenburg, the front of a shoemaker's store was blown in and shoes were scattered over the street (G)
- A schooner in Lunenburg harbour was also severely damaged (G)

September 18, 1944

- One man died in Pictou when he was electrocuted by a downed power line (G)
- Fishing boat lost in Digby harbour (ET)

NEW BRUNSWICK

September 16, 1944

- Power outages in Fredericton and surrounding areas (G)

September 18, 1944

- *Thousands of dollars* of damage to fishing gear on the Bay of Fundy (TJ)

PRINCE EDWARD ISLAND

September 16, 1944

- 25 mm (1 in) of rain in Charlottetown (G)
- Slight damage to power and phone lines on the island (G)

September 18, 1944

- Small fishing vessel damaged in Alberton harbour (TJ)

NEWFOUNDLAND

September 17, 1944

- Extensive damage to Deer Lake Highway and Humber Roads in Newfoundland (ET)
- The middle of Corner Brook was under water when storm sewers flooded (ET)
- A bridge at St. Bernard's Academy was badly damaged (ET)
- Flooding of a Public School in Bell's Brook (ET)

1944–9

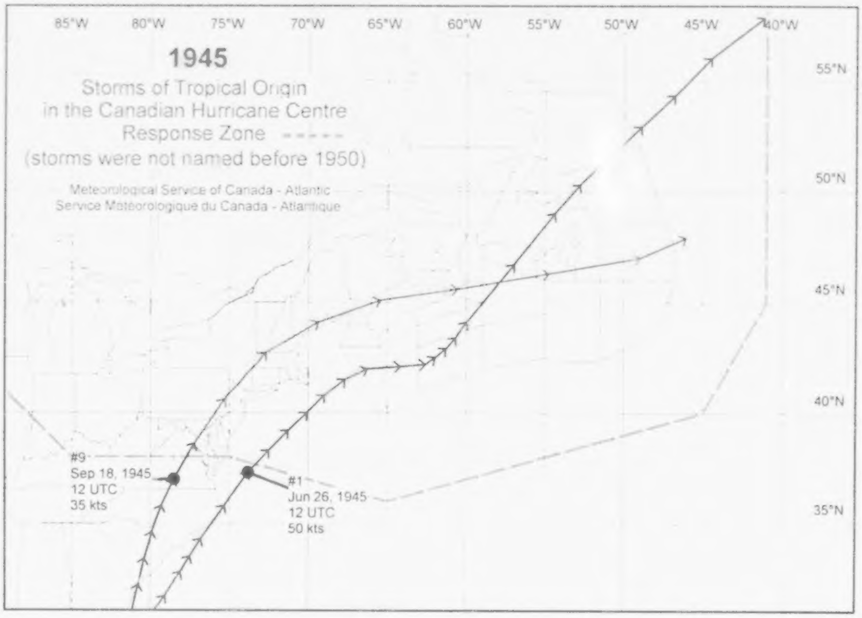
Storm #9 formed west of the Cape Verde Islands in the Atlantic Ocean on September 21, 1944. The storm tracked northwest, turned to the northeast, then entered the CHC Response Zone as a hurricane on September 25th. It moved into southeastern Canadian waters in the early hours of September 26th as a strong category-1 hurricane with winds of 148 km/h (80 knots) and exited the CHC Response Zone as a post tropical storm on September 27th. Maximum wind speeds of 157 km/h (85 knots) were recorded within the CHC Response Zone. This storm remained in the marine section of the CHC Response Zone and did not impact Canada.

1944–11

Storm #11 made landfall at Nova Scotia and Newfoundland as a tropical storm with winds of 84 km/h (45 knots) and 74 km/h (40 knots) respectively, on October 22nd.

Storm #11 began in the Caribbean Sea east of Nicaragua on October 12, 1944, tracked north, made landfall in Florida, crossed the southeastern United States, and entered the CHC Response Zone as a tropical storm on October 21st. Storm #11 moved into southwestern Canadian waters in the early evening of October 21st and made landfall in western Nova Scotia just before midnight as a 83 km/h (45-knot) tropical storm. The newly transitioned post tropical storm dissipated south of Greenland on October 23rd. The storm reached a maximum wind speed of 195 km/h (105 knots) and 84 km/h (45 knots) in the CHC Response Zone. No damage statistics were located attributing this storm as the cause.

1945 – MAP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35°N
1945
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#9
Sep 18, 1945
12 UTC
35 kts
#1
Jun 26, 1945
12 UTC
50 kts

1945–1

Storm #1 made landfall over Newfoundland as a tropical storm with winds of 74 km/h (40 knots) on June 29th.

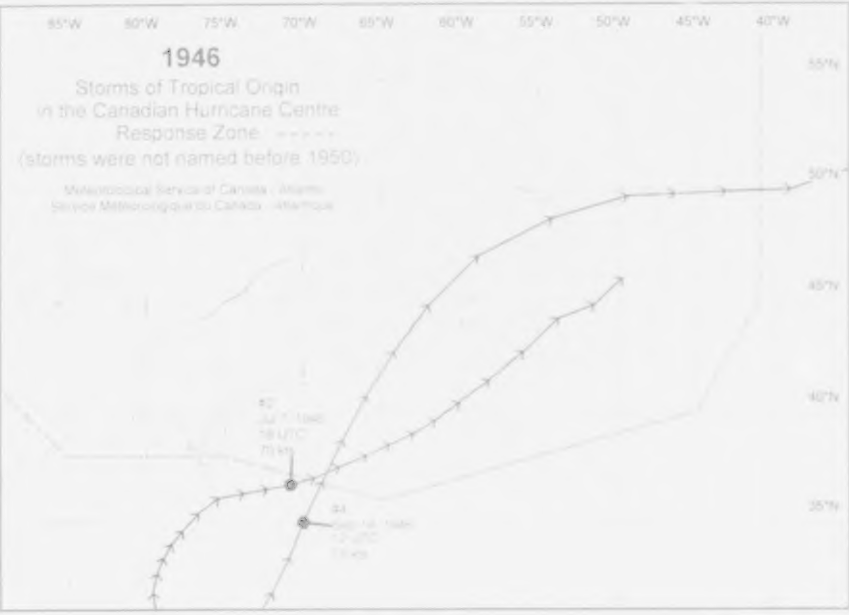
Storm #1 developed in the Caribbean Sea on June 20, 1945. It strengthened into a category three hurricane, carrying winds of 185 km/h (100 knots). While weakening into a tropical storm, the system entered the CHC Response Zone on June 26th and carried winds of 111 km/h (60 knots). It entered Canadian waters on the evening of June 27th as a 102 km/h (55-knot) tropical storm and slowly made its way towards Newfoundland before making landfall in that province in the afternoon of the 29th as a 74 km/h (40-knot) tropical storm. It stayed within the CHC Response Zone and dissipated on July 1st. Canada was not significantly impacted by this storm.

1945–9

Storm #9 made landfall over New Brunswick and Nova Scotia as a tropical depression with winds of 46 km/h (25 knots) on September 19th.

Storm #9 formed east of the Lesser Antilles on September 12, 1945. Intensifying into a category three storm, it carried winds of 222 km/h (120 knots). However, the system was weakening greatly as it entered the CHC Response Zone on September 18th. It entered the Bay of Fundy waters and then Nova Scotia as a tropical depression on September 19th. In the CHC Response Zone, it brought winds of 56 km/h (30 knots) to the region before diminishing later that same day not having damaged Canadian interests.

1946 – MAP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40°N
35°N
1946
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2
Jul 7, 1946
18 UTC
70 kt
#4

1946–2

Storm #2 developed on July 5, 1946 off the east coast of Florida. This storm intensified into a category one hurricane at it maximum strength. Storm #2 entered the CHC Response Zone on July 8th while it was at it strongest point. It weakened to a 93 km/h (50-knot) tropical storm before entering southeastern Canadian waters on the evening of July 9th. The storm lasted with the CHC Response Zone for three days, before dissipating on July 10th and did not damage Canada.

1946–4

Storm #4 made landfall over Nova Scotia as a tropical storm with winds of 102 km/h (55 knots) on September 15th. Storm #4 also made landfall over Newfoundland as tropical storm with winds of 92 km/h (50 knots) on September 16th.

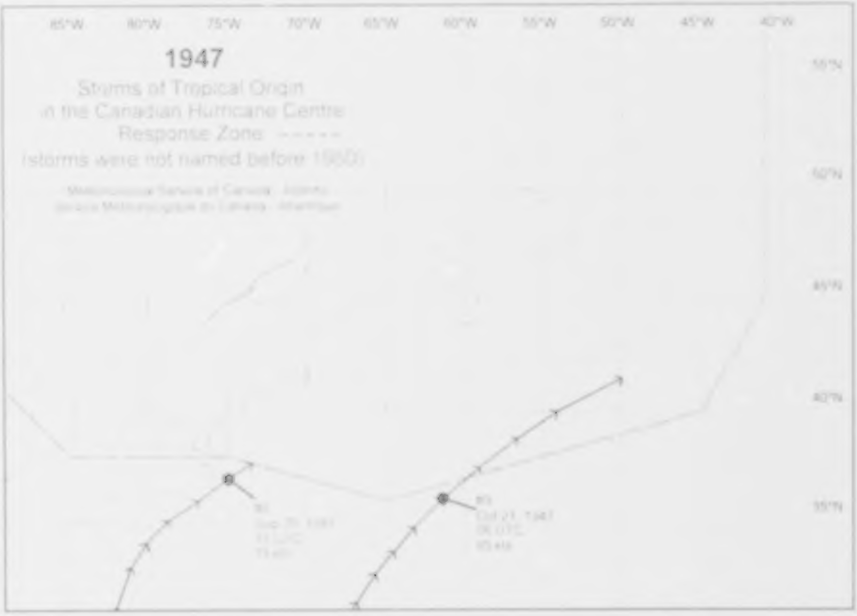
Storm #4 formed south of Florida on September 12, 1946. This hurricane brought winds as high as 157 km/h (85 knots), making it a category two hurricane at its maximum strength. The storm carried winds of 138 km/h (75 knots) when it entered the CHC Response Zone on September 14th and maintained winds of 70 knots as it entered Canadian waters early on the 15th. The storm moved into eastern Nova Scotia on the afternoon of the 15th with winds of 102 km/h (55 knots). Despite the high winds and heavy rain brought to the area, no damage was reported. Storm #4 lasted within the CHC Response Zone until it diminished on September 17th.

NOVA SCOTIA

September 16, 1946

- Parts of the province experienced 96 km/h (52 knots) winds, accompanied with heavy rain. There were no reports of damage (HH)
- Debert experienced 81 km/h (44 knots) winds (HH)
- Sable Island had winds of 94 km/h (51 knots) gusting to 113 km/h (61 knots) (HH)
- Halifax reported 75 mm (2.9 in) of rainfall with 48 km/h (26 knots) winds (HH)
- Kentville reported 50 mm (2 in) of rain (HH)
- The apple orchards were untouched (HH)
- Yachts in the Royal Nova Scotia Yacht Squadron race "The Hood Cup" had to turn around due to heavy seas (HH)

1947 – MAP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35°N
1947
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique

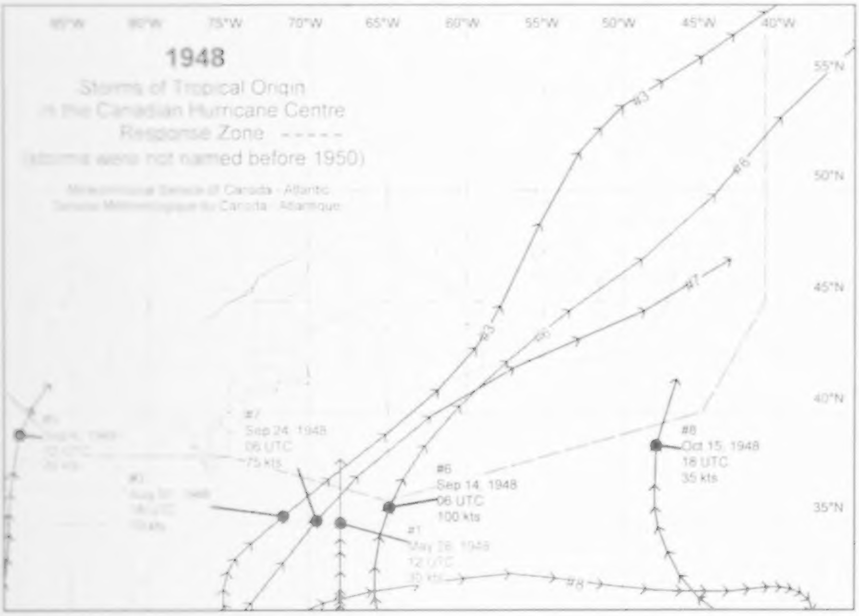
1947–6

Storm #6 formed on September 20, 1947 off the coast of Cuba. The storm only reached tropical storm status and its winds reached a maximum of 93 km/h (50 knots). Storm #6 entered the CHC Response Zone on September 25th as a tropical depression and brought winds of 28 km/h (15 knots) to the region. The storm dissipated later the same day and did not impact Canada.

1947–9

Storm #9 formed near the Greater Antilles on October 16, 1947. Intensifying into a category three hurricane, Storm #9 carried winds of 195 km/h (105 knots). As it entered the CHC Response Zone on October 22nd, Storm #9 weakened into a category one storm. It brought winds of 120 km/h (65 knots) to the CHC Response Zone before dissipating the same day and did not result in any damage reported in Canada. It did not enter Canadian waters.

1948 – MAP


85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
40°W
1948
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
55°N
50°N
45°N
40°N
35°N
#3
#6
#7
#8
#7
Sep 24, 1948
06 UTC
75 kts
#3
#6
Sep 14, 1948
06 UTC
100 kts
#1
May 28, 1948
12 UTC
30 kts
#8
Oct 15, 1948
18 UTC
35 kts

1948–1

Storm #1 developed near the Greater Antilles on May 22, 1948 and tracked west of Bermuda. The storm never reached hurricane status, remaining as a tropical storm with winds of 83 km/h (45 knots). Storm #1 entered the CHC Response Zone on May 28th and dissipated the same day. It brought 55 km/h (30 knots) winds to the region, although no damage was reported from this storm.

1948–3

Storm #3 made landfall over Newfoundland as a tropical storm with winds of 93 km/h (50 knots) on September 2nd.

Beginning on August 26, 1948, Storm #3 developed into a category three hurricane near the Lesser Antilles. Maximum winds of 194 km/h (105 knots) were recorded. While entering the CHC Response Zone, Storm #3 had weakened to a category one hurricane. It remained in the CHC Response Zone from September 1st to September 4th and had a maximum wind speed of 120 km/h (65 knots) in the region. The storm entered Canadian waters in the late morning of September 1st as a strong tropical storm of 111 km/h (60 knots) and made landfall in Newfoundland 15 hours later with winds of 93 km/h (50 knots). Newfoundland experienced the worst damage due to the storm. Power was lost, communication services were out of order, and there was damage to many of the fishing vessels and gear. Port au Port, Newfoundland in particular was hit hard by the storm. The storm dissipated while leaving the CHC Response Zone on September 4th.

NOVA SCOTIA

September 2, 1948

- Winds of 96–105 km/h (52–57 knots) and driving rain were felt in the Cape Breton Area (G)
- Glace Bay and Sydney, Cape Breton were covered in wreckage after a hurricane passed over (G)
- Most coal mines were closed (G)
- Mainland Nova Scotia escaped the damage (G)
- Power and communication lines were interrupted and only one line was available between Halifax and Sydney (G)
- Many pleasure crafts in Sydney were wrecked along the shore, as they did not take the precautions necessary to secure their boats before the storm (G)
- In Canso, the gale left a sunken boat, a roofless barn, and levelled fences (HH)

September 3, 1948

- A man fell off the wharf at North Sydney and was slightly injured (HH)
- Winds of 113 km/h (61 knots) in Sydney were reported (HH)
- Cape Breton recorded only winds of 32 km/h (18 knots) (G)
- Wentworth Park looked like a dump in Sydney (HH)
- Many uprooted trees covered the streets (G)
- Falling trees wrecked cars (G)
- Many small crafts were smashed against the coastline (G)
- *Hundreds of dollars* of circus equipment was damaged (G)

NEWFOUNDLAND

September 2, 1948

- Communication lines were out west of Corner Brook (ET)
- Railway operations were stopped for precautionary measures (ET)

- All St. John's sporting events were postponed after the rainstorm (ET)

September 3, 1948

- Winds in St. John's reached 81–96 km/h (44–52 knots) and in Gander more than 50 mm (2 in) of rain fell (HH)
- A French trawler was damaged during the storm. It made its way to St. John's from St. Pierre, France, and was in sinking condition. The damage was located at the rivets in the bow (ET)
- In the Port au Port area, over *$200,000* of damage was reported (ET)
- Abbott & Haliburtons store in Port au Port had it roof blown off which cost *$20,000* of damage to the structure and stock (ET)
- The Church of England, in Port au Port was completely destroyed in the town (ET)
- In Petites, estimates of the damage to fishing premises and local roads was *$1,500* (ET)
- One man lost the stage landing of a section of his flake and 350 gal (1,300 L) of cod oil (ET)
- Exceptional tides were reported in the area of Petites (ET)
- In Lamaline, many fishing stages were badly damaged and a lot of gear was swept away. 15,000 kg (33,000 lbs) of fish was lost at Allan's Island, and high seas did a lot of damage to the crops (ET)
- Part of the Lamaline West breakwater was destroyed including one pilot light (ET)
- Two vessels *Mildred* and *McCall* were driven ashore at Piccadilly. The *Mildred* was a total loss but the *McCall* was resurfaced (ET)
- Transportation and communication was tied-up in St. John's (HH)
- A Grand Bank correspondent reported the *M.V. Robert Bros.* went ashore in the storm at Allan's Island (ET)
- The pier at Aquathuna Limestone Quarry was also destroyed with damage estimated at *$150,000* (ET)
- Many other houses and barns sustained minor damage (ET)
- Seas washed out roads in several places including Lorries where the road was blocked for a mile by sand thrown by the tide (ET)

September 4, 1948

- Winds reached a speed of 96 km/h (52 knots) in English Harbour West (ET)
- Winds gusted to 129 km/h (70 knots) on the south coast (ET)
- Ernest Harmon Air Force Base in Stephenville had a maximum wind of 147 km/h (80 knots) (ET)
- In English Harbour West, Trinity Bay a lot of damage was done to fishing property–*$300–$400* per boat of damage was done (ET)

- Stages, cellars, and homes were damaged–fences and vegetables were destroyed and roads were impassable (ET)
- The *Silver Star* was badly damages (ET)
- At Boxey, the breakwater was damaged and will need considerable repairs (ET)
- At Grand Bruit, the United Church was moved off its foundation and much damage was done to the building (ET)
- At Mose Ambrose, flakes and stages along with a motorboat were damaged (ET)
- At Coombs Cove, the boat *Willie S.* and a motorboat were sunk (ET)
- Parker's Cove, Placentia Bay had severe damage–all flakes and wharves were destroyed–stages were badly damaged (ET)
- In Round Harbour in White Bay, the roof was blown off a home and was damaged extensively (ET)
- In Grand Falls, large trees were blown down, some chimneys were wrecked and basements flooded (ET)
- In the Humber area, a tractor shed was blown away (ET)
- A number of pleasure boats on suburban ponds were swamped (ET)
- Estimated damage on the South Coast was ***$400,000***. An Anglican Church was demolished ***$200,000***. Two vessels were driven ashore and a store valued at ***$20,000*** had blown apart (HH)

September 7, 1948

- The storm brought in waves over 6 m (20 ft) high and wiped out outhouses and stages at Englee (ET)
- In Canada Harbour, four motorboats and five punts, along with stages were destroyed (ET)
- At Fishof Island, three boats and two stages were damaged (ET)
- At St. Julian's, three small motorboats and 5,000 kg (11,000 lbs) of fish were lost along with flakes and stages (ET)
- At Croquet, roofs were blown off and four boats were lost along with all the crops destroyed (ET)
- At Conche, two large fishing boats were lost and one punt was lost (ET)
- At Groais Island, 76 m (250 ft) of bridge was swept away and at Harbour Deep, stages flakes and boats along with an amount of fish was lost (ET)
- At Fishing Head, near St. Anthony, a 45 m (150 ft) fishing tower was destroyed. Also all communication lines were down and several boats were driven ashore (ET)
- In Frederickton, a house was lifted off it foundation and siding was stripped from many other houses. Windows were blown in and fences blown down. The lighthouse was blown down over the point (ET)
- In Badgers Quay, three homes were blown from their foundations and also some stores. Also, fences were knocked down (ET)

- In Wesleyville, several boats dragged there anchors but no real damage was reported. One schooner went ashore at Black Point Pinchard's Island (ET)

September 8, 1948

- Grand Falls reported slight damage mostly confined to broken trees. Shingles and felt were blown of the roves of several houses. Basements were also flooded (ET)
- In the district, garden crops were heavily hit (ET)

September 11, 1948

- 93 mm (3.7 in) of rain fell in Grand Falls (ET)
- Stony Brook was reported to have had its water rushing the fastest in history (ET)

NEW BRUNSWICK

September 2, 1948

- Five, four engine airliners landed at Moncton airport in the evening during the storm. A flight attendant said the sky was filled with planes looking for a place to land. American Overseas Airways, Trans-World Airline, Seaboard, Western Airlines, and Trans-Ocean Airlines operated the planes (HH)

1948–5

Storm #5 developed on September 1, 1948 as a category one hurricane in the Gulf of Mexico. Containing maximum winds of 129 km/h (30 knots) Storm #5 eventually weakened as it entered the CHC Response Zone inland on September 6th. Becoming a tropical depression, Storm #5 died on September 7th and did not significantly impact Canada.

1948–6 † (2 Canadian fatalities)

Developing near the Cape Verde Islands, Storm #6 began on September 4, 1948 and became a category four hurricane, with winds as strong as 213 km/h (115 knots). Storm #6 weakened slightly as it entered the CHC Response Zone on September 14th as a category three hurricane. It weakened quickly to a strong category one hurricane of 148 km/h (80 knots) by the time it moved into Canadian waters after midnight on the 15th.

Although it remained offshore from Newfoundland, flooding was present throughout that province: several bridges fell, and many roads were damaged. **A child was killed when a landslide damaged a home in Newfoundland and a man died when his schooner was caught in the storm.** On September 16th, the hurricane left the CHC Response Zone and diminished on the same day.

September 17, 1948

- One man was lost from the Portuguese schooner *Gaspar* when it was caught in the storm and 41 other men were rescued from the abandoned ship (ET)

NEWFOUNDLAND

September 15, 1948

- Two coastal railway steamers were delayed from Newfoundland port (ET)

September 16, 1948

- A three year old girl died when a landslide demolished part of her home on Southside Road West. The landslide of sod and clay ran down the hill and crashed into the first floor of there home (ET)
- All train traffic halted in St. John's during the storm (ET)
- Silt covered the tracks on the southside of St. John's, and there were other disturbances along the line from the city to Holyrood (ET)
- At Holyrood, a small trestle with two concrete abutments was washed out into the bay (ET)
- At Avondale, the track was covered with gravel for several hours (ET)
- At Torbay Airport, all flights were cancelled until the storm passed (ET)
- The highway around Conception Bay was closed to traffic at Avondale, and motor vehicles had to bypass at Holyrood (ET)
- The road to Cape Saint Francis was damaged. Washouts were as big as 1.2 m (4 ft) deep and small bridges were damaged or washed away (ET)
- Damage was caused to four other homes in the area and damages to the personal belongings (ET)
- Waterford River was also drastically flooded with water. At the bend near Mill Bridge the river overflowed and flooded 13 houses (ET)
- Mill Lane and Southside Road in St. John's, were also flooded when a river flooded causing danger to more houses (ET)
- The Springdale Street and Water Street area where the hardest hit streets in St. John's (ET)
- Feildian Grounds were flooded and the river flowing into Quidi Vidi Lake was flooded (ET)
- Poplar Avenue in St. John's was flooded (ET)

- A taxi was stranded in 0.6 m (2 ft) of water and men had to paddle boats to get to their home, as a blocked sewer flooded the street (ET)
- Topsail Road was flooded on Palk's Hill. It washed away part of a sidewalk on the entrance to Water Street and uprooted slabs of pavement (ET)
- At Syme's Bridge, the flood went through a section of the road from the southern side creating a deep gap about 4.5 m (15 ft) wide (ET)
- A bridge next to Waterford Hall was also flooded (ET)
- At Kilbride, a river overflowed and was running into Bowring Park's swimming and boat pools. It continued to flow over the breakwater at Littledale Church and threw up large pieces of pavement (ET)
- The telegram counted three poles down, and the Waterford River poles were either down or angled (ET)
- On Newtown Road there were five poles lying across the road (ET)
- Blackhead Road was completely impassable. Hundreds of tons of gravel were lying over the tracks (ET)
- In Avondale, a house was almost completely submerged in water formed by a new lake (ET)
- Hanlon's Bridge on Nagle's Hill was carried away and the road to Mount Scio was washed out (ET)
- Long Pond rose 1.2 m (4 ft) above normal and overflowed the road near the bridge for 30 m (100 ft) (ET)
- At Thorburn Turnpike near Kenmount Road, the entire area was converted into a lake (ET)
- On Elizabeth Street, St. John's, water from the north side created lakes at several places (ET)
- On Rennie's Mill Road in St. John's, a column of water rushed from the manhole 0.6 m (2 ft) in the air. Rennie's River rose to a height that it broke the left bank and overflowed the land between the river and Portugal Cove Road (ET)
- At Kent's Pond a wide stream flowed across the road (ET)
- Much of Old Cove Road near Round Pond, St. John's was under water and Oliver's Pond swept frothy and deep water across the road (ET)

September 17, 1948

- The West End Fire Hall near LeMarchant Road, St. John's was flooded (ET)
- On Cabot Street, St. John's, water washed away an embankment near a property (ET)

September 18, 1948

- One ship reported winds of more than 130 km/h (70 knots) off Grand Bank (ET)
- A record of 115 mm (4.5 in) of rain fell at Fort Pepperrell (ET)
- Washout between Tors Cove and Mobile was approximately 6 m (20 ft) long and 4.2 m (14 ft) deep (ET)

- Between Tors Cove and Hell Hill, there were a few washouts (ET)
- After Hell Hill, there were a few washouts near Witless Bay (ET)
- At Holyrood, serious washouts occurred on the highway (ET)
- At Baybulls, Witless Bay there were washouts reported (ET)
- At Outer Cove, a landslide damaged the road (ET)
- From Pouch Cove to Bauline, debris piled up against a bridge and blocked the road (ET)
- At St. Brides and Cuslett a bridge was washed away (ET)
- From the Placentia Road junction to town of Placentia the road was severely damaged (ET)
- At Mitchell's Brook Salmonier, the bridge was washed away (ET)
- At Patrick's Cove, Placentia Bay the road was completely destroyed (ET)
- At St. Joseph's Salmonier, a road was washed out (ET)
- Little Barrachoi Road was washed out (ET)
- Raging water created a ravine 1 m (3 ft) long and 1–1.5 m (3–5 ft) wide. It took out about 0.6 m (2 ft) of the White Hills Road surface and 1.2 m (4 ft) off the shoulder (ET)

1948–7

Storm #7 originated off the coast of Jamaica and passed south of Nova Scotia and Newfoundland. Beginning on September 18, 1948, Storm #7 developed into a category three hurricane. It carried winds that reached a maximum of 194 km/h (105 knots). Entering the CHC Response Zone on September 24th as a category one hurricane but weakened to a 102 km/h (55-knot) tropical storm by the time it entered Canadian waters late on September 25th. Sable Island reported strong winds and vessels in the Atlantic were battered by the storm. The storm continued for one more day, ending on September 25th.

NOVA SCOTIA

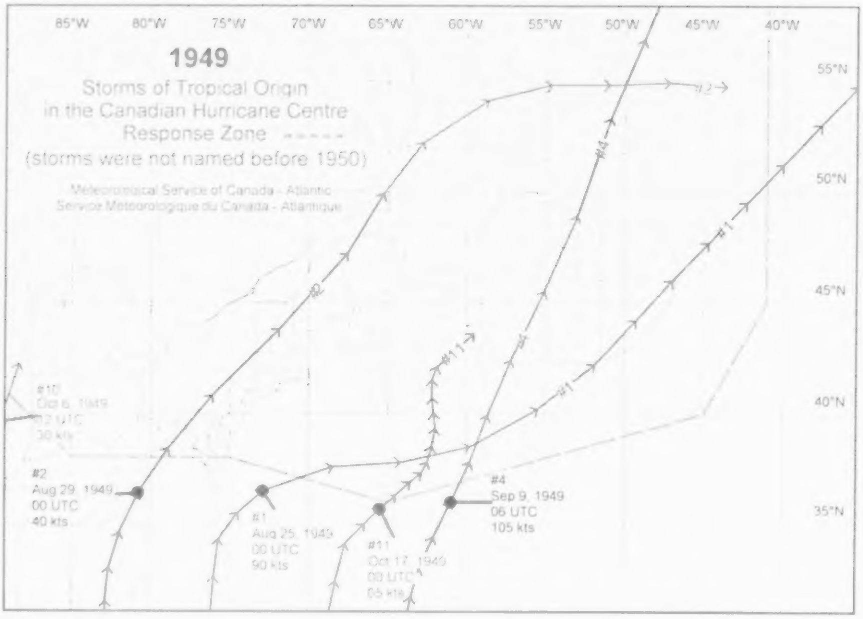
September 25, 1948

- Sable Island had 120 km/h (65 knots) winds (HH)
- Six vessels were battered during the storm 240 km (150 mi) off the coast of Halifax (HH)

1948–8

Storm #8 began on October 3, 1948 off the coast of Nicaragua and Honduras and developed into a category four hurricane. The hurricane gradually weakened and entered the CHC Response Zone on October 15th as a tropical storm containing winds of 65 km/h (35 knots). On October 16th. the storm weakened even further and dissipated not having impacted Canada.

1949 – MAP


85°W
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40°N
35°N
1949
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
(storms were not named before 1950)
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#10
Oct 6, 1949
12 UTC
30 kts
#2
Aug 29, 1949
00 UTC
40 kts
#1
Aug 25, 1949
00 UTC
90 kts
#11
Oct 17, 1949
00 UTC
65 kts
#4
Sep 9, 1949
06 UTC
105 kts
#1
#2
#4
#11

1949–1

Storm #1 began on the northern edge of the Lesser Antilles on August 21, 1949. It developed into a category two hurricane, with winds of 176 km/h (95 knots). As it entered the CHC Response Zone on August 25th, winds were 157 km/h (85 knots) and it remained at marginal hurricane strength as it entered the Grand Banks waters early on the 26th. The hurricane left the CHC Response Zone on August 27th, dissipated on August 28th, and did not cause damage in Canada.

1949–2 † (3 Canadian fatalities)

Storm #2 made landfall in New Brunswick and Quebec on August 29th and August 30th respectively, as a tropical storm with winds of 65 km/h (35 knots). Storm #2 also made landfall over Labrador as a tropical depression with winds of 55 km/h (30 knots) on August 30th.

Storm #2 originated over the Lesser Antilles on August 23, 1949. Early in its life cycle, Storm #2 was a category four hurricane with 240 km/h (130 knots) winds, but it was only a tropical storm when it entered the CHC Response Zone on August 29th. The storm affected the Maritimes and the effects were felt as far away as Ontario. High winds caused power disruptions and communication cutoffs. **Three men were killed in Quebec** and three children were injured when they were blown off a patio. Storm #2 dissipated on August 31st.

ONTARIO

September 1, 1949

- 87 km/h (47 knots) gusts hit Toronto (TS)
- Power was disrupted in Oakville and ships were delayed on Lake Ontario (TS)
- The CNE (Canadian National Exhibition) in Toronto had to be cancelled for the first time in history because of the high winds and rain (G)
- The tobacco fields in Delhi were hit with heavy damages (G)

September 2, 1949

- Maximum winds reached 95 km/h (52 knots) over the Niagara River (MG)
- Communication between Toronto, Montreal, and Ottawa were cutoff for over two and a half hours (MG)
- Two people were rescued in Owen Sound when their seaplane flipped over (MG)

QUEBEC

September 1, 1949

- Two workman died in Quebec: one was electrocuted by downed wires and the other was killed when a flying piece of wood from a bridge struck him in the head (G)
- Winds averaged 55 km/h (30 knots) in Montreal (G)

September 2, 1949

- A third man dies when a tree fell through his buggy when he was driving it (MG)
- Three children were injured in Montreal when they were blown off backyard patios (MG)

1949–4

Storm #4 moved over the Avalon Peninsula of Newfoundland on the morning of September 10, 1949 as a category one hurricane with winds of 120 km/h (65 knots).

Storm #4 formed between the Greater Antilles and the Lesser Antilles on September 3, 1949. It reached a maximum strength of a category three hurricane with winds of 203 km/h (110 knots). The storm entered the CHC Response Zone and also Canadian waters as a category two hurricane on September 9th and made landfall on the Avalon Peninsula of Newfoundland September 10 with winds of 120 km/h (65 knots). Most of St. John's, Newfoundland, received heavy rain, however, winds were not strong. One boat was wrecked along the Newfoundland coast. Storm #4 dissipated on September 11th.

NEWFOUNDLAND

September 10, 1949

- St. John's records 48 mm (1.9 in) of rain (ET)

September 12, 1949

- Most communities outside of St. John's had heavy rains of up to 50 mm (2 in) and not heavy winds (ET)

September 13, 1949

- The boat, *Bayfield*, was pounded to pieces on the rocky shores but all crewmembers got to shore safely (ET)

1949–10

Storm #10 began on September 27, 1949 on the south coast of El Salvador. Passing over Guatemala and into the Gulf of Mexico the storm strengthened into a category four hurricane and contained winds as high as 213 km/h (115 km/h). As it continued moving, Storm #10 entered the CHC Response Zone on October 6th. Upon its entry into the CHC Response Zone well inland, it had weakened into a tropical depression with winds of 46 km/h (25 knots). Storm #10 weakened even more that same day and dissipated. Canada reported no damage as a result of this storm.

1949–11

Storm #11 began over Jamaica on October 12, 1949 and grew to a category two hurricane with winds of 165 km/h (90 knots). The hurricane weakened to a tropical storm as it entered the CHC Response Zone on October 17th and still had winds of 83 km/h (45 knots) when it reached Canadian waters on October 19th. The storm dissipated later that day.

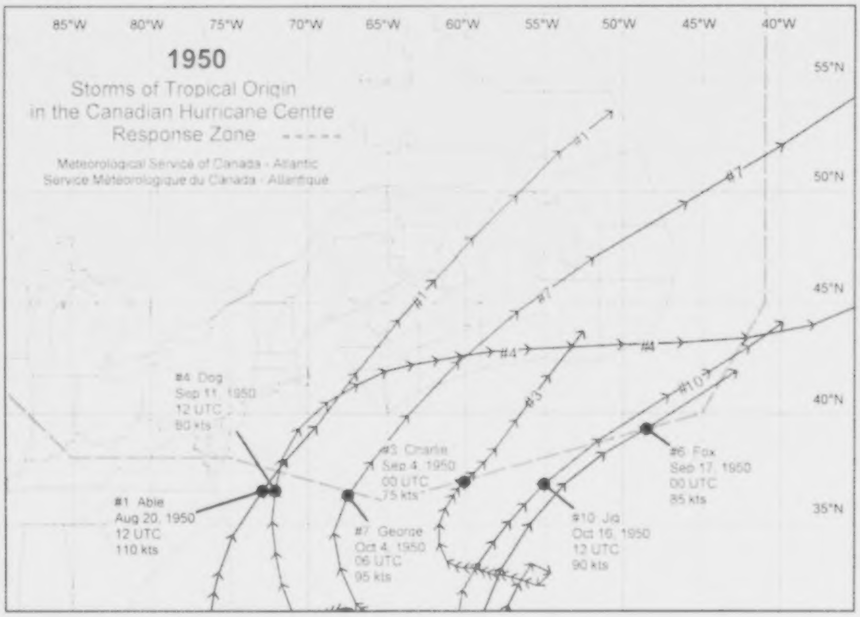
October 17, 1949

- Hurricane passed well south of Maritimes (HH)

October 20, 1949

- The storm made a couple of attempts to threaten the Maritimes but weakened and drifted eastward causing no damage (TJ)

1950 – MAP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40°N
35°N
1950
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#1
#7
#4
#3
#10
#4 Dog
Sep 11, 1950
12 UTC
80 kts
#3 Charlie
Sep 4, 1950
00 UTC
75 kts
#6 Fox
Sep 17, 1950
00 UTC
85 kts
#1 Able
Aug 20, 1950
12 UTC
110 kts
#7 George
Oct 4, 1950
06 UTC
95 kts
#10 Jig
Oct 16, 1950
12 UTC
90 kts

1950–Able † (2 Canadian fatalities)

Hurricane Able—the first Atlantic tropical cyclone in the era of "named storms"—made landfall on the morning of August 21st just west of Halifax, Nova Scotia, as a tropical storm with winds of 65 km/h (35 knots). Able also made landfall over Newfoundland as a tropical depression with winds of 55 km/h (30 knots) on August 22nd.

Hurricane Able was discovered just east of the Lesser Antilles on August 12, 1950. Able grew to a category four hurricane with winds of 222 km/h (120 knots). When Able entered the CHC Response Zone on August 20th it was still a category three hurricane with 195 km/h (105 knots) winds, but it weakened quickly. It entered Canadian waters as a marginal category one hurricane shortly after midnight on the morning of the 21st, and made landfall just west of Halifax, NS, later that morning as a tropical storm. High winds were reported from portions of the Maritimes as Able underwent extratropical transition and the official maximum wind strength is lower than many of the individual reports. As well, heavy rain fell throughout Nova Scotia. Flooding, power outages, and damage to the apple crops were reported in Nova Scotia and Prince Edward Island. Roads and bridges were also washed away. **Two children died when their raft was overturned.** Able dissipated on August 22nd.

- Caused flooding throughout Nova Scotia (CDD)

NOVA SCOTIA

August 22, 1950

- Winds of 160 km/h (87 knots) were recorded in Halifax (TJ)
- In Debert, 81 mm (3.2 in) of rain fell (TJ)
- More than 125 mm (4.9 in) of rain fell in the Annapolis Valley (HH)
- One boat was carried out to sea and many others were smashed against the shore in Canada Creek (HH)
- The heaviest damage, *$500,000*, occurred in the Annapolis Valley with the apple crops (TJ)
- Minor damage was reported (flooding, broken tree limbs, power outages) (TJ)
- The province's damage costs estimated at over *$1 million* (HH)
- The main bridge on the Parrsboro-Truro highway was washed out (HH)

August 23, 1950

- 50 mm (2 in) or more, of rain fell in Amherst (TJ)
- Residents of Bass River became stranded when the bridge was washed away (HH)
- Traffic on the Springhill-Truro and Oxford-Truro was halted due to washouts (HH)

August 24, 1950

- Two children died when their raft overturned and they drowned (HH)
- Clam Point had winds of 105 km/h (57 knots), large trees were uprooted, electrical power was lost all morning, and roofs were torn off barns (HH)
- A large barn in Meteghan had one side of it torn off during the heavy gale (HH)

NEW BRUNSWICK

August 22, 1950

- Saint John had 108 mm (4.3 in) of rain (TJ)

PRINCE EDWARD ISLAND

August 22, 1950

- Estimated to be three to four days before every home in the province would have their power restored (G)

- Many main streets in Charlottetown and throughout the province were flooded and impassable (G)

1950–Charlie

Hurricane Charlie formed off the Cape Verde Islands on August 21, 1950. Charlie developed into a category three hurricane, bringing winds as high as 185 km/h (100 km/h). It entered Canadian waters late on September 5th at a strength of 83 km/h (45 knots) and dissipated shortly thereafter. Charlie did not cause any damage reported in Canada.

1950–Dog † (12 Canadian fatalities)

Hurricane Dog originated just east of the Lesser Antilles. Dog grew to an enormous category five hurricane with 297 km/h (160 knots) winds but had weakened to a category one hurricane before entering the CHC Response Zone on September 11th. The storm entered southwestern Canadian waters on the morning of September 12th as a strong tropical storm of 111 km/h (60 knots). **Twelve men aboard two boats were reported missing during the storm.** The storm remained in the CHC Response Zone for five days before leaving on September 15th. It then dissipated on September 17th.

NOVA SCOTIA

September 13, 1950

- Two 15 m (49 ft) boats with six men aboard each, the *Nickerson* and *Sir Echo*, went missing off the southwestern coast in the storm (HH)
- Winds of 80 km/h (44 knots) reported in the province (HH)

1950–Fox

Hurricane Fox began in the mid-Atlantic Ocean on September 8, 1950. Fox developed into a category four hurricane containing winds of 222 km/h (120 knots). It entered the

CHC Response Zone on September 17th and diminished the same day. Canada was not impacted by this storm.

1950–George

Hurricane George formed northwest of the Lesser Antilles on September 27, 1950. George intensified to a strong category two hurricane with winds of 175 km/h (95 knots) upon entering the CHC Response Zone and maintained this strength as it entered Canadian waters in the late afternoon of October 4th. George remained at sea and created high winds and heavy rain on Sable Island and passed just south of the Avalon Peninsula of Newfoundland as a hurricane. Hurricane George left the CHC Response Zone on October 6th, and dissipated on October 7th. Despite its proximity to Newfoundland no damage information was obtained for that province.

NOVA SCOTIA

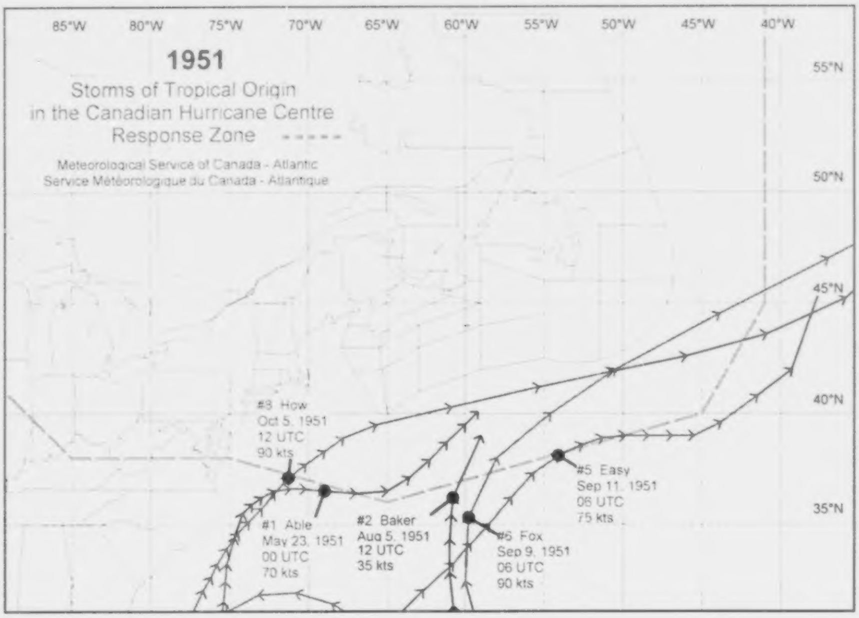
October 5, 1950

- 145 km/h (78 knots) winds and over 100 mm (3.9 in) of rain were recorded on Sable Island (ET)

1950–Jig

Hurricane Jig formed northeast of the Lesser Antilles on October 11, 1950. Jig became a category three hurricane, with winds of 194 km/h (105 knots). It entered the CHC Response Zone on October 16th and dissipated on October 17th. No damage statistics were reported in Canada from Jig.

1951 – MAP


85°W
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45°W
40°W
55°N
50°N
45°N
40°N
35°N
1951
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#8 How
Oct 5, 1951
12 UTC
90 kts
#1 Able
May 23, 1951
00 UTC
70 kts
#2 Baker
Aug 5, 1951
12 UTC
35 kts
#6 Fox
Sep 9, 1951
06 UTC
90 kts
#5 Easy
Sep 11, 1951
06 UTC
75 kts

1951–Able

Hurricane Able began on May 15, 1951 south of Bermuda. Able developed into a category three hurricane containing winds as high as 185 km/h (100 knots). It entered the CHC Response Zone on May 23rd as it was weakening into a tropical storm. Within the CHC Response Zone, it brought winds of 111 km/h (60 knots). Hurricane Able did not last much longer inside the CHC Response Zone as it dissipated on May 24th and it did not impact Canada.

1951–Baker

Tropical Storm Baker formed in the mid-Atlantic Ocean on August 2, 1951. The storm never developed into a hurricane, containing winds that peaked at 92 km/h (50 knots). Baker passed into the CHC Response Zone on August 5th while being downgraded into a tropical depression. Inside the CHC Response Zone, it only carried winds of 55 km/h (30 knots), and dissipated the same day. Baker did not result in any damage reported in Canada.

1951–Easy

Hurricane Easy developed in the mid-Atlantic Ocean on September 2, 1951. Easy intensified into a maximum category five hurricane and carried winds of 259 km/h (140 knots). When entering the CHC Response Zone on September 11th, Hurricane Easy had weakened to a category one hurricane and brought winds of 138 km/h (75 knots) to the region. Hurricane Easy remained within the CHC Response Zone for one day, before leaving on September 12th and dissipating on September 13th. No damage reports were identified in Canada related to Hurricane Easy.

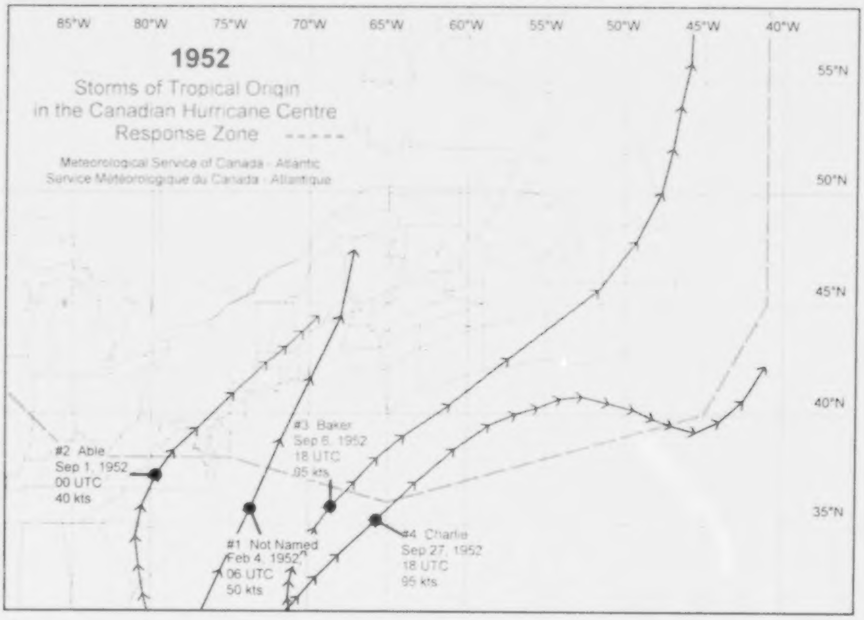
1951–Fox

Hurricane Fox formed off the Cape Verde Island on September 2, 1951. Fox developed into a category three hurricane containing winds of 185 km/h (85 knots) at its maximum strength. The hurricane entered the CHC Response Zone on September 9th as it weakened just slightly into a category two hurricane, and brought winds of 157 km/h (85 knots) to the CHC Response Zone. Fox later left the CHC Response Zone on September 10th and diminished on September 11th. Fox did not damage Canadian territory.

1951–How

Hurricane How developed south of Cuba on September 28, 1951 and intensified into a category two hurricane. It brought winds of 176 km/h (95 knots) at its maximum strength and winds of 166 km/h (90 knots) when it entered the CHC Response Zone on October 5th. How remained within the CHC Response Zone for another two days before leaving on October 7th and dissipating on October 8th. Hurricane How did not impact Canada.

1952 – MAP


85°W
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45°N
40°N
35°N
1952
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2 Able
Sep 1, 1952
00 UTC
40 kts
#3 Baker
Sep 6, 1952
18 UTC
85 kts
#1 Not Named
Feb 4, 1952
06 UTC
50 kts
#4 Charlie
Sep 27, 1952
18 UTC
95 kts

1952–NN-1

NN-1 made landfall over New Brunswick as a tropical storm with winds of 84 km/h (45 knots) on February 5th.

NN-1 began between Honduras and Belize on February 2, 1952. Only developing into a tropical storm, and never reaching hurricane status, NN-1 was a very unique storm as it is the only Atlantic tropical cyclone recorded in the month of February. NN-1 carried winds of 92 km/h (50 knots). It entered the CHC Response Zone on February 4th and made landfall late that evening in New Brunswick at a strength of 83 km/h (45 knots). The impacts to Canada were minimal.

1952–Able

On August 18, 1952 Hurricane Able formed off the Cape Verde Islands. Able developed into a category two hurricane containing winds of 166 km/h (90 knots). It entered the CHC Response Zone on September 1st and dissipated on September 2nd. Able did not result in any damage in Canada.

1952–Baker

Baker originated in the Lesser Antilles on August 31, 1952. Hurricane Baker strengthened into a category three hurricane with winds as high as 194 km/h (105 knots). Baker was a category two hurricane with winds of 167 km/h (90 knots) when it entered the CHC Response Zone on September 7th and a 139 km/h (75-knot) hurricane as it moved into Canadian waters early that evening. Despite just missing Newfoundland, the Avalon Peninsula experienced high winds and some damage. Hurricane Baker left the CHC Response Zone on September 9th and diminished the same day.

NEWFOUNDLAND

September 8, 1952

- Winds of 77 km/h (42 knots) with gusts to 113 km/h (61 knots) on the Avalon Peninsula (ET)

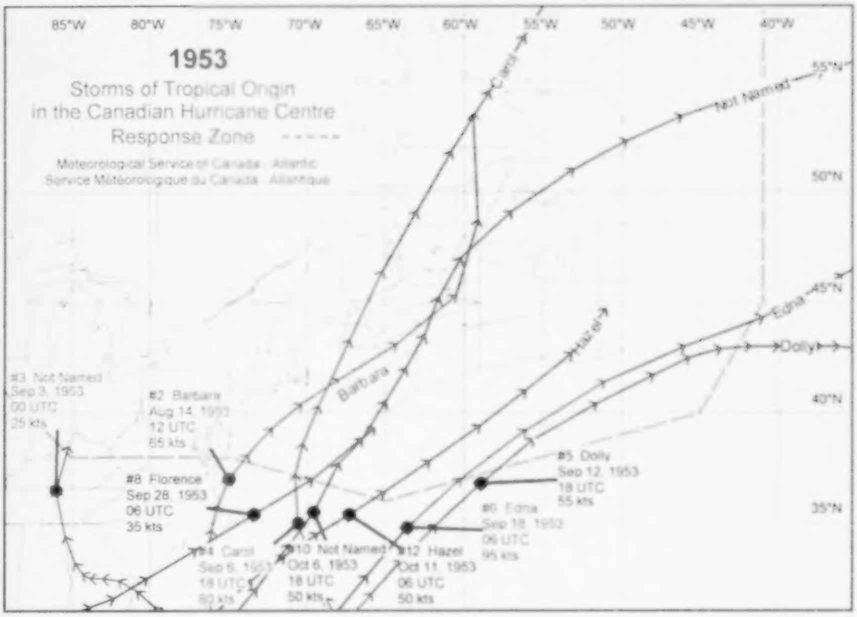
September 9, 1952

- Fishing was halted for the rest of the season in Lower Island Cove because the wharf had been stripped by the gale (ET)
- Fishing is expected to decline and money is expected to be lost (ET)

1952–Charlie

Hurricane Charlie originated on September 22, 1952 near the Lesser Antilles. Charlie developed into a category three hurricane and contained winds as high as 194 km/h (105 knots) at its maximum strength. Upon entering the CHC Response Zone on September 28th Charlie had become a category two hurricane and attained winds of 176 km/h (95 knots). Hurricane Charlie left the CHC Response Zone on September 30th and dissipated on October 1st. Charlie did not result in any damage reported in Canada.

1953 – MAP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65°W
60°W
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45°W
40°W
55°N
50°N
45°N
40°N
35°N
1953
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Carol
Not Named
Hazel
Edna
Dolly
Barbara
#3 Not Named Sep 3, 1953 00 UTC 25 kts
#2 Barbara Aug 14, 1953 12 UTC 55 kts
#8 Florence Sep 28, 1953 06 UTC 35 kts
#4 Carol Sep 6, 1953 18 UTC 80 kts
#10 Not Named Oct 6, 1953 18 UTC 50 kts
#12 Hazel Oct 11, 1953 06 UTC 50 kts
#6 Edna Sep 18, 1953 06 UTC 95 kts
#5 Dolly Sep 12, 1953 18 UTC 55 kts

1953–Barbara † (2 Canadian fatalities)

Barbara made landfall over Nova Scotia, Newfoundland, Quebec and Labrador on August 15-16th as a tropical storm with winds of 102 km/h (55 knots) in Nova Scotia and Newfoundland and winds of 93 km/h (50 knots) in Quebec and Labrador.

Hurricane Barbara began on August 11, 1953 near the Greater Antilles. Developing into a category two hurricane, Barbara attained winds of 176 km/h (95 knots). Barbara entered Canadian waters as a category one hurricane of 139 km/h (75 knots) on the morning of August 15th and land fall on Cape Breton later that evening as a 55-knot (102 km/h) tropical storm. **Barbara took the life of two Portuguese fishermen off the Grand Banks.** Hurricane Barbara lasted for five days and diminished on August 16th.

August 17, 1953

- Two Portuguese fishermen on the banker *Anna Maria* were believed to have drowned in a gale off the Grand Banks after their dories capsized (TJ)

1953–Carol † (1 Canadian fatality)

Tracking between the eastern seaboard and Bermuda, Carol made landfall as a category one hurricane in New Brunswick after entering the CHC Response Zone on September 7th at 2130 UTC. Upon making landfall, maximum winds of 120 km/h (65 knots) blew along the southern coast of the province. Carol also made landfall over Quebec and Labrador as a tropical storm with winds of 102 km/h (55 knots) and 93 km/h (50 knots) respectively, on September 8th.

Hurricane Carol developed on August 28, 1953 near the Cape Verde Islands. Comprised of winds of 240 km/h (130 knots), Carol was a category four hurricane. Winds in the CHC Response Zone were recorded as high as 148 km/h (80 knots). Carol was a 130 km/h (70-knot) hurricane as it entered Canadian waters shortly after noon September 7th, and made landfall later that evening in New Brunswick as a marginal category one hurricane. Telephone, power, and telegraph services were interrupted, fishing gear and boats were damaged, several people were injured, and **one death was reported**. Crops were damaged and trees littered many streets. Hurricane Carol diminished on September 9th.

September 8, 1953

- Spanish and Portuguese fishing vessels took shelter from the Grand Banks before the storm hit (TJ)

September 11, 1953

- French Luxury liner with 1,075 passengers ran aground in the Bay of Fundy in dense fog. No one was hurt (HH)

NOVA SCOTIA

- 14,000 m^3 (about 6 million board feet) of timber was lost in the province (D)
- The majority of trees blown down occurred in partially cut areas. There was also minor damage reported to areas of undisturbed forests (D)

September 8, 1953

- A passenger on the yacht *Vagrant* lost his life when he slipped off the deck near Cow Bay. Another passenger went in the water to save him but he slipped away. The passenger got back to the boat but was admitted to hospital in shock (HH,TJ)
- Halifax had winds of 72 km/h (39 knots) gusting to 105 km/h (57 knots) (HH)
- Dartmouth received 96 km/h (52 knots) winds and trees were blown across power lines (MG)
- Winds of 113 km/h (61 knots) off Nova Scotia (G)
- A 12 m (40 ft) unmanned schooner dragged her anchor and hit the shore in Dartmouth (MG)

- Telephone, power, and telegraph services were disrupted throughout the Eastern Provinces. Also, Truro, Charlottetown and outskirts of Halifax had power outages (MG)
- The Dartmouth–Halifax ferry was delayed and trips were taking 20 minutes compared to the regular 10 minutes (TJ)
- In Halifax, at least 12 glass windows were broken and two warehouse doors were blown away (ET)
- In Prospect, heavy seas crashed over a wharf and destroyed a garage, flooding over the road and then flooding a field on the other side. Several stagings were swept away with barrels and other fishing gear (ET,HH)
- The Prince Edward Island–Nova Scotia ferry was tied up during the height of the storm (ET)
- Three schooners were reported to have dragged their anchors in Shelburne harbour (ET)
- A two-story house on the corner of Lady Hammond Road and Basin View Drive in Halifax had the roof blown off (HH)
- The air raid siren on the Roy Building on Barrington Street in Halifax blew off and landed on a crevasse on the roof (HH)
- The Public Gardens in Halifax had four of the biggest trees snap off and the flower beds were raked to shreds (HH)
- On the southern coast, fish, houses and staging were swept away (HH)
- In the Wolfville area, the apple crop damage was estimated at 50%. The peach trees were stripped of their crop and the grain and corn in other areas were flattened or ruined (HH)
- Stewiacke-Shubenacadie-Alton area power was out for the day and would possibly take until the next day to fix (HH)
- 250,000 barrels of apples fell to the ground in the province (ET)
- The average farmer loss was 45% of their crop (ET)
- Estimates were over ***$1 million*** in damages to the apple and farm crops (HH)
- Had left untold damage to the Annapolis Valley apple orchards and golden grain fields (G)
- One schooner had rammed a dock, a yacht sunk at a wharf, and four other yachts were aground in Chester (ET)
- A schooner in Dartmouth was ripped from its anchor and pounded ashore (ET)
- 22.8 m (75 ft) fishing vessel, *Joyce Marie* was reported to be sinking off the western part of the province and was taking a beating. A US Coast Guard Ship was deployed to rescue the crew (G)
- Canadian Broadcasting Corporation's (CBC's) television and radio transmitter in Halifax went off air during the storm (TJ)
- Wires carrying Canadian Press news to newspapers and radio stations were disrupted (TJ)

- A lady walking along Cornwallis Street in Kentville became entangled in a live wire and suffered burns. She was brought to Blanchard Fraser Memorial Hospital (HH)
- 22,000 volts of power was directed into a home in Debert, when a power cable snapped outside the home (HH)

September 9, 1953

- A man's body was found on the shore of Clam Harbour. The man drowned five months ago but his body was never found until it washed ashore yesterday (HH)
- Winds at Halifax reached 129 km/h (70 knots) (TJ)
- A man in Chester suffered serious head injuries after being hit in the head by a winch while raising the *Starrling* yacht from the Chester harbour where she sank during the storm. He was attended to on the scene and then rushed to the Halifax Victoria General Hospital where he suffered a possible fractured skull (HH)
- A man was taken to hospital after being hit by a wave in Herring Cove. He was washed up, hit a huge boulder, and suffered a concussion (HH)
- A Liverpool teenager was injured when a falling tree struck him, hurting his shoulder on Mersey Avenue and was taken to Queens County Hospital (HH)
- The 15.2 m (50 ft) pleasure schooner that ran aground in Mill Cove, Halifax harbour was a complete loss (TJ)
- 40 power breaks in Halifax alone (TJ)
- In Dartmouth, light standards at a ball park were blown down (TJ)
- 11 yachts in Chester harbour sank during the height of the storm. Only the tops of the spars were at the surface of the ocean (HH)
- On the South Shore 30 poles were blown down and 15 trees were lying across telephone lines in a 16 km (10 mi) stretch (HH)
- The main building in the Lunenburg County Exhibition was severely damaged when the metal roof 9.8 by 4.8 m (32 by 16 ft) was blown off. It ended up 90 m (300 ft) away against a wire fence. The two rear doors were bent at the middle by the winds (HH)
- The Junior/Senior School in Liverpool also suffered heavy damage and a tree crashed through Milford's garage (HH)
- A power line in Yarmouth fell on a station wagon while a man was driving. The live wire sent sparks everywhere, but he was unhurt (HH)
- Amherst, Cumberland County grain crop was hard hit by the high winds and rain, which flattened the crop (HH)
- Berwick was the hardest hit with over 100 telephones out of service (HH)
- 33% of the apple crop was destroyed (HH)
- 45% of 1.5 million bushels of apple crop was on the ground in Annapolis Valley. This loss alone would almost reach *$1 million* (TJ)

NEW BRUNSWICK

September 8, 1953

- Winds in Saint John were 72 km/h (39 knots) and rains cancelled Labor Day celebrations and activities (TJ)
- Fringe winds that tossed down trees, cut telephone, and power lines (G)
- Moncton streets flooded with 0.9–1.2 m (3–4 ft) of water when their sewers became plugged (G)
- The Prince Edward Island–New Brunswick ferry was tied up during the height of the storm (ET)

PRINCE EDWARD ISLAND

September 8, 1953

- In Charlottetown, there was minor damage to trees (MG)
- Winds tossed down trees, cut telephone and power lines (G)
- The Prince Edward Island–New Brunswick and Prince Edward Island–Nova Scotia ferries were both tied up during the height of the storm (ET)
- The ferry between Borden and Cape Tormentine was delayed, and the Wood Island and Caribou missed one trip (G)
- Roofs were blown off, and a chimney was toppled over from a residences home. Bricks were left all across the lawn (G)
- Large trees were uprooted in Kings Square, near Lennox Hotel on Water Street and on Kent Street (G)

QUEBEC

September 8, 1953

- Hurricane Carol's rainy weather caused a search for a plane crash in Northern Quebec to be cancelled for the day. The hurricane was not the cause of the crash (TJ)

1953–NN-1

Tropical Storm NN-1 originated near the Greater Antilles on August 28, 1953. Winds whipping from the storm were measured at 92 km/h (50 knots), however upon entering the CHC Response Zone the storm had diminished and winds were measured at 37 km/h

(20 knots). Lasting just seven days, Tropical Storm NN-1 dissipated inland on September 3rd. NN-1 did not result in any damage in Canada.

1953–Dolly

Hurricane Dolly developed on September 8, 1953 near the Greater Antilles. Dolly formed into a category three hurricane bringing winds of 185 km/h (100 knots). Entering the CHC Response Zone on September 12th, Dolly was downgraded to a tropical storm with 102 km/h (55 knots) winds and left the CHC Response Zone on September 14th. Hurricane Dolly dissipated on September 17th. Dolly did not cause any damage in Canada.

1953–Edna

Beginning on September 14, 1953, Hurricane Edna developed into a category three hurricane with winds as high as 203 km/h (110 knots) near the Lesser Antilles. It entered the CHC Response Zone on September 18th with 157 km/h (85 knots) winds and exited on September 19th as it was weakening. It dissipated the next day, September 20th. Edna did not result in any damage reported in Canada.

1953–Florence

Hurricane Florence began on September 23, 1953 near the Greater Antilles. It reached its maximum force as a category three hurricane bringing 185 km/h (100 knots) winds. Entering the CHC Response Zone on September 28th, Florence became a tropical storm, its winds subsided to 64 km/h (35 knots); Florence dissipated the same day. Florence did not impact Canada.

1953–NN-3 † (2 Canadian fatalities)

NN-3 originated on October 3, 1953 near the Greater Antilles. NN-3 reached tropical storm status and contained maximum winds of 111 km/h (60 knots). Upon entering the CHC Response Zone, the storm was at its maximum strength and eventually made landfall in Nova Scotia in the early morning of October 8th as a strong tropical storm with winds of 111 km/h (60 knots). **One Nova Scotia man was found dead and another missing after their ship was found battered and washed ashore**. Also in Newfoundland, many roads were washed away or damaged.

NEWFOUNDLAND

October 8, 1953

- Victoria Park, St. John's grounds were flooded after Wednesday's rain and left the park in a mess. Cans, wood, oil barrels and rails were littered all over the park. Ditches and drains were created from the force of the water (ET)
- Rain flowing from the heights above the park brought debris and clogged the entrance to the dam of the swimming pool. It then went down the left side of the park and out through Bennett Lane, carrying topsoil to Water Street in St. John's (ET)
- Holes and ditches were made in Bennett's Lane due to the force of the water (ET)
- Traffic was blocked and Bennett's Lane was closed in St. John's (ET)
- The flow of water brought topsoil and gravel to some doors of residents on Southside Road, St. John's (ET)

October 10, 1953

- The rain extensively scoured all roads main, secondary, and local on the Avalon on Wednesday (ET)
- Most of the damage occurred in the Conception Bay area (ET)
- On Saddle Hill in Carbonear, the pavement was washed out for 61 m (200 ft) (ET)
- In Red Head Cove, 245 m (500 ft) of road was washed out (ET)
- Northern Bay had 18 m (60 ft) of road washed out (ET)
- Spout Cove had 21 m (70 ft) of road washed out (ET)
- At Flatrock, Carbonear, a secondary road was badly washed out and the abutments of a bridge were carried away (ET)
- On the Hearts Content-Victoria Road there was also another washout (ET)
- Calvert and Mobile Hills were badly rutted on the southern shore (ET)
- Another washout occurred at Rattle Brook near Boat Harbour on the Marystown Road (ET)

NOVA SCOTIA

October 10, 1953

- **A Broad Cove fisherman's body was found washed upon the shore in the harbour close to his 7.3 m (24 ft) battered fishing vessel.** He was sailing from Cheticamp to Broad Cove. **His companion has not been found** and the search was still taking place (HH)
- The storm lashed the west coast of Cape Breton most of the week (HH)

1953–Hazel

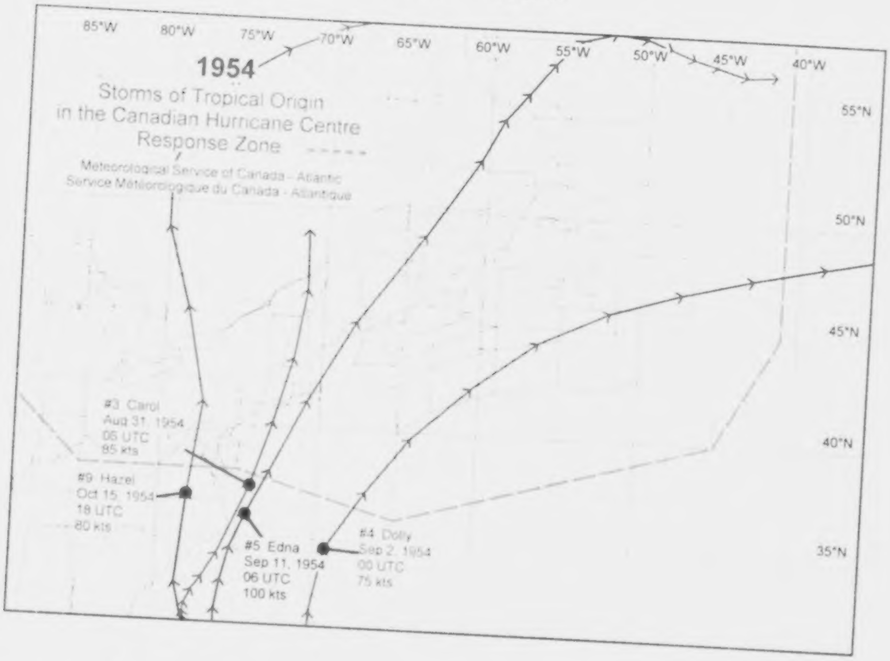
Tropical Storm Hazel originated on October 7, 1953 near the Mexico coast with 111 km/h (60 knots) winds. Upon entering the CHC Response Zone on October 11th. Hazel was considerably weakened with winds of 93 km/h (50 knots). It entered Canadian waters near dawn on October 12 at a strength of 74 km/h (40 knots) and brought winds and rain to Sable Island before dissipating later that day.

NOVA SCOTIA

October 12, 1953

- Heavy rain and high winds were reported on Sable Island (HH)

1954 – MAP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45°N
40°N
35°N
1954
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#3 Carol
Aug 31, 1954
06 UTC
85 kts
#9 Hazel
Oct 15, 1954
18 UTC
80 kts
#5 Edna
Sep 11, 1954
06 UTC
100 kts
#4 Dolly
Sep 2, 1954
00 UTC
75 kts

1954–Carol

Carol entered Canada late on August 31st, over Quebec City, Quebec as a category one hurricane and continued north. Wind speeds were 139 km/h (75 knots) upon the storm's entry to Quebec with gusts reported at 75 km/h (41 knots) in Yarmouth, Nova Scotia.

Hurricane Carol formed near the northeastern Bahamas on August 25, 1954. It crashed across the New England states diminishing as it swept into Canada. Carol was a category two hurricane with winds of 157 km/h (85 knots) when it entered the CHC Response Zone on August 31st and still at 139 km/h (75 knots) as it entered Quebec late that evening. Carol caused wind and rain damage in New Brunswick, Nova Scotia, Quebec, and Ontario. Carol diminished over northern Quebec on September 1st.

NEW BRUNSWICK

September 1, 1954

- Power outages in Saint John area including Rothesay Village to One Mile House, East Saint John, Red Head, Loch Lomond, and Little River (ET)
- Telephone lines were down in Gagetown, Edmundston, Newcastle, Woodstock and Andover (ET)
- Power outages in Gagetown, Plaster Rock, and Sussex (ET)
- Flights from Saint John to Boston and Montreal were cancelled (ET)
- A cow died in Millville (TJ)
- Power outages and telephone services were out in Millville (TJ)
- Trees fell on a total of three cars on Dorchester Street and Drummond Street in Saint John (MG)
- Traffic blocked by trees on Drummond Street, Sherbrooke Street, and Peel Street in Saint John (MG)
- Power outages also in the Westfield area, in Lancaster along Manawagonish Road, on Victoria Street, and on Millidge Avenue (ET)

NOVA SCOTIA

September 1, 1954

- Yarmouth had 64 km/h (35 knots) winds with gusts to 75 km/h (41 knots) (HH)
- No major damage to Nova Scotia (HH)
- Four pleasure boats damaged in Lake Milo, Yarmouth (HH)

QUEBEC

September 1, 1954

- 65 mm (2.6 in) of rain fell at the McGill Observatory in Montreal (MG)
- *$1 million* of damage in Montreal (MG)
- Underpasses and subways were flooded in Montreal (MG)
- Telephone services were down in Cookshire, Megantic, Scotstown and Bury (MG)
- Power outages in Montreal included the eastern and northeastern parts of the city; Westmount, Cote Saint Paul, Montreal East, Cote Saint Luc, Dorval, Pointe Claire, Chambly and Richelieu (MG)

ONTARIO

September 1, 1954

- Ottawa-Montreal highway covered in mud near Hawkesbury (MG)

1954–Dolly

Dolly formed on August 31, 1954, southeast of the Bahamas. This was a very small hurricane that moved very rapidly northward, then northeastwardly and packed winds of 157 km/h (85 knots) at its peak. On September 2nd, Dolly entered Canadian waters with 129 km/h (70-knot) winds and passed to the south of Nova Scotia and Newfoundland, exiting the CHC Response Zone on September 3rd and dissipating on September 4th. This hurricane remained at sea and no damage was reported.

NEWFOUNDLAND

September 3, 1954

- No damage from Dolly (ET)

1954–Edna † (1 Canadian fatality)

On September 11th at 0030 UTC, Edna was a category one hurricane that moved into southwestern New Brunswick with winds measuring 120 km/h (65 knots). Edna also made landfall over Quebec and Labrador as a tropical storm with winds of 111 km/h (60 knots) on September 12th. Extensive wind damage was sustained in Nova Scotia.

Hurricane Edna formed from an easterly wave on the afternoon of September 2, 1954, southeast of Barbados. Edna entered the CHC Response Zone on September 8th and maximum winds recorded for this storm were 194 km/h (105 knots). Edna made landfall in New Brunswick as a marginal category one hurricane late on the 11th, then weakened to tropical storm strength over southern Quebec and Labrador before heading out to sea, and exited the CHC Response Zone on September 13th. Winds of up to 160 km/h (87 knots) were reported in Yarmouth and damage was in the *millions of dollars* across New Brunswick and Nova Scotia. Edna was a large sprawling storm that pushed hurricane force gusts across much of Nova Scotia. **Only one person died in Nova Scotia**, but numerous people were injured. Edna dissipated on September 15th.

- Edna caused damage and flooding (CDD)
- Nova Scotia Department of Natural Resources reported forestry losses of 1.6–1.8 million m^3 (about 700–750 million board feet) (D)
- Total damage in New Brunswick: ***$1.776 million*** (CDD)

NEW BRUNSWICK

September 13, 1954

- Winds up to 120 km/h (65 knots) in New Brunswick and 130 mm (5.1 in) of rain (MG)
- One man severely hurt in New Brunswick (MG)
- Fireman were injured in New Brunswick (TJ)
- Power and telephone lines down in the province(MG)
- Fishing boat lost in Grand Manan (ET)
- Weirs, breakwaters and lobsters pots also lost on Grand Manan, damage valued at ***$250,000*** (ET)
- Flooded streets in St. Stephen (MG)
- ***$100,000*** theatre destroyed in McAdam (ET)
- ***$100,000*** of pulpwood swept out to sea at Dalhousie (ET)
- Roof blew off a house in Lancaster (TJ)
- Three families evacuated from their home in East End Grounds (TJ)
- Tree on First Street fell on a garage in Saint John (TJ)
- Falling chimney damaged the 2nd floor of a house on Duke Street in Saint John (TJ)
- Windows broken all over the city (TJ)
- Three walls were ripped off a house at McLaren's beach (TJ)
- ***$4,000*** boat was lost in Seal Cove (TJ)

September 14, 1954

- Boat destroyed at Mispec Beach (TJ)

September 15, 1954

- Fredericton–55 mm (2.1 in) of rain fell (TJ)
- 400 salmon lost at Dalhousie with a loss of ***$10,000*** (TJ)

NOVA SCOTIA

- Majority of the damage occurred between 9:00 pm and 2:00 am ADT on September 11-12th (D)
- Maximum 10-minute windspeed was 101 km/h (55 knots) and the maximum gust was 138 km/h (75 knots) at the Dartmouth Naval Station (D)
- Rainfall was 20 mm (0.8 in) on the evening of the 11th and was reported to be moderate to heavy (D)
- The lowest barometer reading recorded was 985 mb (29.11 in) (D)
- Damage to trees occurred both in undisturbed and partially cut forests. Uprooting of the tree was more common than breaking of the trunk in the type of damage done (D)

September 13, 1954

- One man died after being crushed when his barn collapsed (MG)
- 95 km/h (52 knots) in Halifax (HH)
- 160 km/h (87 knots) winds in Yarmouth (MG)
- One man injured his hands and shoulder while fixing the power lines in Halifax (HH)
- Damage totalling ***$6 million*** in Nova Scotia (HH)
- Power and telephone lines down and many barns blew away in the province (MG)
- Fish plants were lifted from their foundations in Nova Scotia (MG)
- Streets blocked by fallen trees all over the province (HH)
- Destroyed ***$3 million*** of the apple crop in the Annapolis Valley (MG)
- Yarmouth and Kentville declared a state of emergency (MG/HH)
- 100 troops of the Black Watch Regiment were called to the Annapolis Valley (HH)
- ***$100,000*** worth of herring fishing equipment was lost at Kelly's Cove (MG)
- Hundreds of lobster pots lost at sea from Yarmouth (MG)
- Damage at the Kelly's Cove fish plant was ***$15,000*** (MG)
- 800 m (0.5 mi) of road washed away in Yarmouth (ET)
- ***$10,000*** of damage to fishing gear in Wedgeport (ET)
- 11.5 m (38 ft) boat wrecked in Yarmouth harbour (ET)
- 3,400 kg (7,500 lbs) of live lobster lost in Yarmouth (HH)
- Braemar Lodge in Yarmouth received ***$25,000*** of damage (MG)
- Yacht club in Shelburne was destroyed (HH)
- 41 m (135 ft) church steeple fell to the ground in Pictou (MG)
- Many livestock died in destroyed barns (ET)
- Roof torn off a Dartmouth molasses factory (ET)

- In Windsor, a man's chimney fell on his car which he carefully parked away from the trees (ET)
- 12 m (40 ft) high press and radio booth toppled in Halifax (HH)
- Apartment building roof blew off in Halifax on Connaught Avenue (HH)
- Private property damage in Kentville was *$100,000* (HH)
- An apartment building under construction in Kentville was totally lost, damage at *$20,000* (HH)
- A chimney fell off the dining hall at Acadia University and fell into the kitchen (HH)
- *Thousands of dollars* of damage in the Pictou, Springhill, and Amherst areas (HH)
- Swamped boats in Armdale Yacht Club (HH)
- 20 small boats swamped in Halifax's yacht club (HH)

September 14, 1954

- Wreck of the US freighter *West Jeffery* was washed into the sea from its landmark position off Wedgeport (known as the Hulk) (TJ)

QUEBEC

September 13, 1954

- Power outages in Montreal (MG)

1954–Hazel † (81 Canadian fatalities)

Hurricane Hazel struck Toronto on October 15, 1954, killing 81 people and leaving 1,896 families homeless. The record rainfalls the storm brought to Toronto, up to 225 mm, was in addition to higher than average precipitation that fall, which prevented the water from infiltrating the ground. Instead, most of the rain ran off the surface into rivers and creeks, rapidly filling them to capacity and beyond. One estimate of runoff was that 90% of the precipitation ran off the land directly into rivers raising the water level by 6 – 8 metres. Water coursed through creeks where they had never before existed, derailed trains and washed out roads. Rampaging rivers tore houses from their foundations, entrained cars and mobile homes, and wrecked boats.

The Humber River Valley was the hardest hit. Raymore Drive was levelled killing 35 people. Further downstream on the Humber, five firemen dispatched to rescue people trapped in their car by floodwaters were killed. The Holland Marsh, located north of Toronto was turned into a lake, ruining houses and crops, and forcing residents to flee. The marsh was pumped dry over several weeks, then the levels of the dykes surrounding the marsh were raised and the drainage ditches deepened. The community of Long Branch, on the shores of Lake Ontario, where Etobicoke Creek enters the lake, was also severely flooded and would be evacuated and turned into a park. Damage was not isolated in these communities, but felt throughout Southern Ontario and as far away as Ottawa.

Recovery began immediately after the waters receded, with the aid of the militia, who searched the river valleys for flood victims; and relief organizations, such as the Red Cross and Salvation Army. Relief organizations rushed to set up temporary shelters, find long term housing for displaced people, collect food and clothing, and raise funds. The Hurricane Relief Fund was created to collect money from people around the city, province, and world; and distribute funds to victims of the flood. How government organizations handled the disaster was evaluated following Hazel. The weather office was both praised for their accuracy and emphatic warnings and denounced for not providing enough warning. The estimated cost of Hazel by a Royal Commission studying the effects was placed at $100,000,000, which today would be approximately $1 billion.

A significant outcome of Hazel was the formation of Toronto and Region Conservation (TRCA) and the prioritization of flood control and flood warnings by the three levels of government. Conservation authorities were granted powers to buy and regulate floodplain land and in cooperation between the three levels of government helped create flood control and flood warning systems. Floodplains were bought from private property owners and returned to the river and development was restricted on the lands. The debate on dams was reopened following Hazel and again when the TRCA presented their Plan for Flood Control and Water Conservation, which would only be partially completed.

The outcome of Hurricane Hazel was the recognition of the flood hazard in Southern Ontario and the development of plans to cope with the risk. Civil defense offices were created and trained with monies provided by the municipal, federal and provincial governments, conservation authorities were allowed more powers to protect vulnerable land, and parklands were formed around the city. If another storm were to follow the exact path and strength of Hazel, the city is better prepared to cope; yet, the risk has not been abolished. Developments remain in the city's floodplains and there is a lack of awareness of the risk; as 50 years has passed local area residents' memory of the storm has faded.

ACKNOWLEDGEMENTS

This website, created to commemorate the 50th anniversary of Hurricane Hazel, was developed under the funding of two projects by the National Search and Rescue Secretariat's New Initiatives Fund: SARNIF # 2002016 (A Climatology of Hurricanes in Canada: Improving Our Awareness of the Threat) and SARNIF # 2003010 (Impacts of Hurricanes over the Canadian East Coast). It was also facilitated by collaboration with a similar project of the Toronto and Region Conservation who produced a commemorative website and produced a TV documentary and DVD on Hazel.

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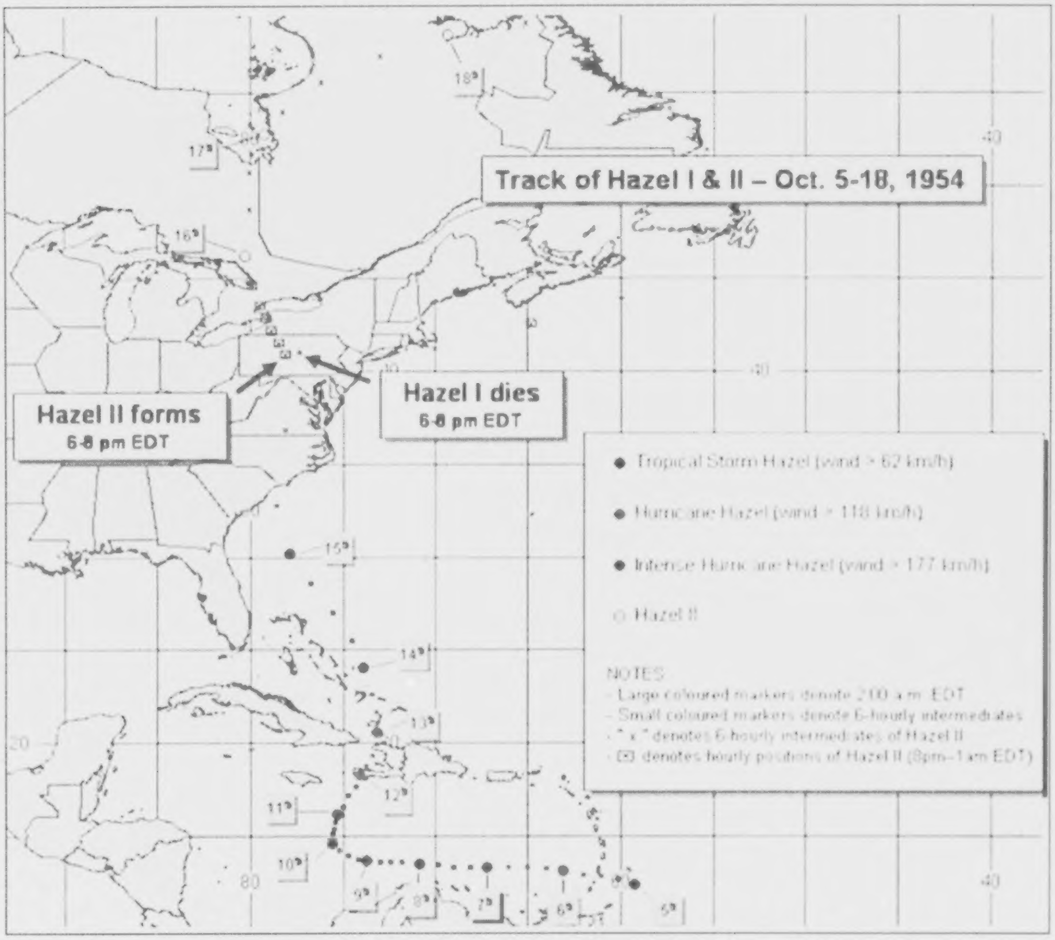
STORM INFORMATION

Storm Development

The Ocean Ranger Storm in 1982 was more intense (winds near 170 km/h). The August Hurricane of 1927 claimed more lives (at least 173). The Ice Storm of 1998 affected more people (over a million households lost power). The Edmonton tornado in 1987 was more sudden (less than an hour warning). Yet, no weather disaster has fixed itself more firmly in Canadian folklore than Hurricane Hazel's impact on Southern Ontario.

Hurricane Hazel formed in the tropics, tracked through the interior of the United States and across the Great Lakes where it merged with a cold front and dropped record rainfall amounts in the Greater Toronto Area. The Toronto area had experienced above average rainfall that autumn, especially in the two weeks prior to Hazel's arrival, saturating the ground and preventing the rainfall from infiltrating the soil. Instead, the water ran off the surface into local rivers, which rose very rapidly, wiping out communities built within their floodplains. The Weather Office warned of Hazel's arrival throughout the day on Friday October 15, 1954, stressing the impending heavy rainfall. Their forecasts were quite accurate, yet, many people did not feel they were adequately warned of the risk posed by the rivers.

Hurricane Hazel did not strike Ontario . . . another storm did! In his 1955 paper in the Bulletin of the American Meteorological Society, Canadian Meteorological Service's senior meteorologist, John Knox, described how the extratropical transition of Hazel resulted in southern Ontario being hit by a dangerous storm that was made more powerful by the hurricane . . . but it was a different storm. In describing the evolution of this new storm, Knox labelled Hazel, the hurricane, as "Hazel I," while the new storm centre which formed south of the Great Lakes was labelled, "Hazel II." The development of "Hazel II" resulted in an apparent *northwestward-jump* of the storm centre and many storm track climatologies mistakingly show Hazel's motion as continuous just south of Lake Ontario. The map below shows the tracks of Hazel I & II.


Track of Hazel I & II – Oct. 5-18, 1954
Hazel II forms
6-8 pm EDT
Hazel I dies
6-8 pm EDT
● Tropical Storm Hazel (wind > 62 km/h)
● Hurricane Hazel (wind > 118 km/h)
● Intense Hurricane Hazel (wind > 177 km/h)
○ Hazel II
NOTES
- Large coloured markers denote 2:00 a.m. EDT
- Small coloured markers denote 6-hourly intermediates
- " x " denotes 6-hourly intermediates of Hazel II
- ☒ denotes hourly positions of Hazel II (8pm–1am EDT)
18th
17th
16th
15th
14th
13th
12th
11th
10th
9th
8th
7th
6th
5th
40
40
40
20
80

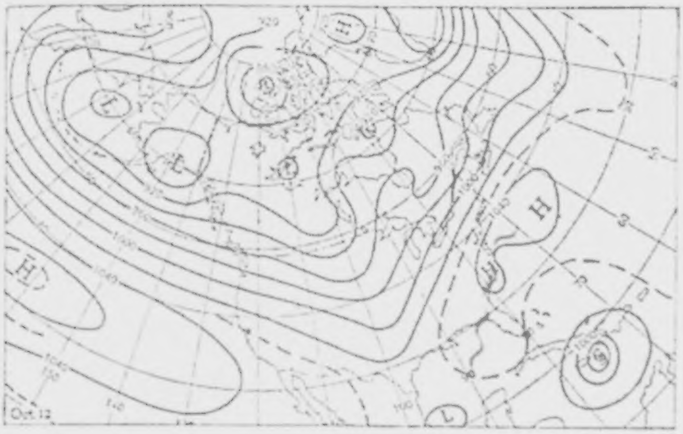
Here is an account of Hazel I & II:

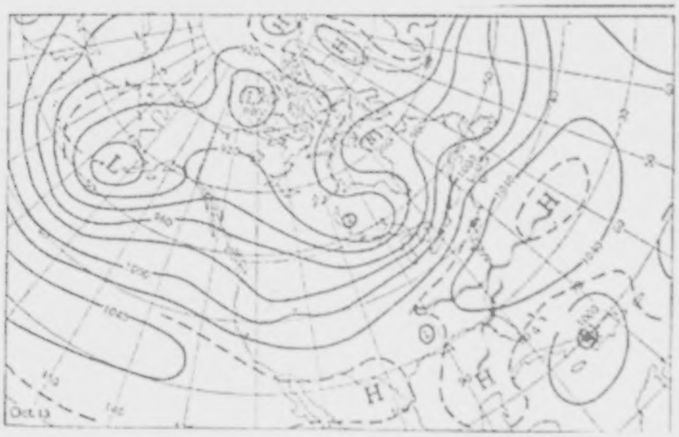
Oct 5	A tropical disturbance near Grenada, at the southern end of the chain of islands in the Caribbean, was classified as a hurricane: "Hazel."
Oct 6-9	Hazel moves slowly westward in the Caribbean ocean: no land areas affected.
Oct 10	Hazel turns abruptly northward.

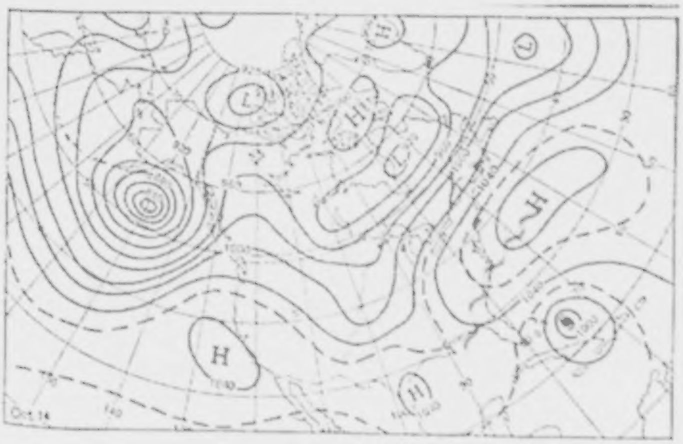
Oct 11	Hazel tracks northward toward Haiti.
Oct 12	Hazel crosses the western tip of Haiti, killing more than 400 people.
Oct 13	Hazel exits northward through channel between Haiti and Cuba then turns northwest toward the U.S. east coast.
Oct 14	Hazel increases forward speed toward U.S. east coast.
Oct 15	Hazel makes landfall in the Carolinas around noon as a marginal Category 4 hurricane. Hazel turns more northward and accelerates, entering Pennsylvania in the early evening, dissipating rapidly. Simultaneously, a rapid and continuous transformation of energy resulted in the formation of Hazel II, the extratropical cyclone, over New York State. By late evening a vastly different storm existed… approaching Lake Ontario. Before leaving the United States, Hazel claimed 95 American lives. The storm centre moved directly over the city of Toronto near midnight.
Oct 16	By morning Hazel II was in Northern Ontario. Between the evening before and the early morning hours of Oct 16, 81 people in southern Ontario died from the flooding rains.

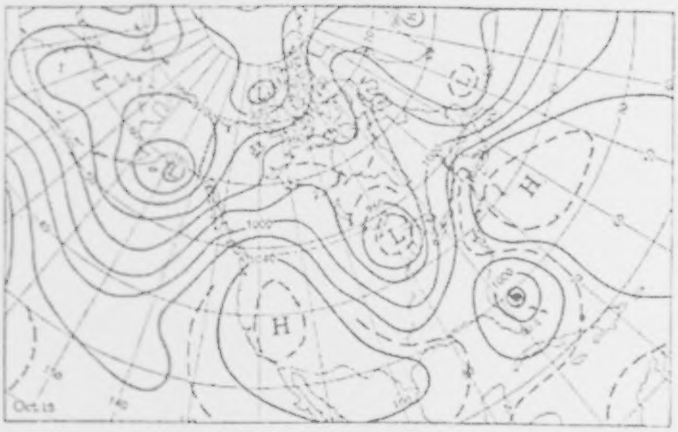
Nowhere is the saying, "timing is everything," truer, than in meteorology. Three events took place with almost *sinister* timing to create catastrophic flooding for Toronto: pre-Hazel rainfall which saturated the ground; a deep and intensifying atmospheric trough approaching from the west; Hurricane Hazel approaching from the south.

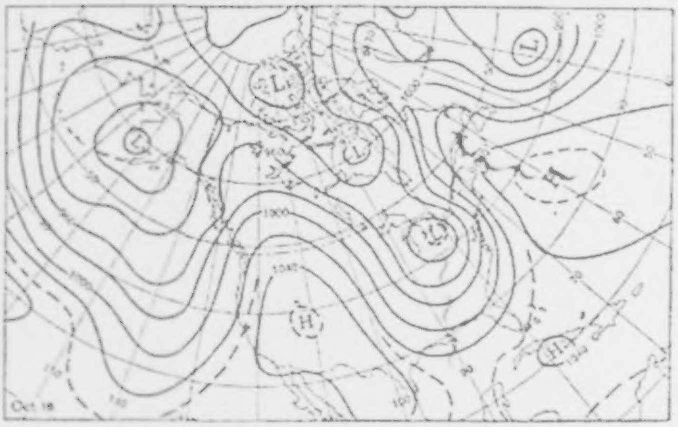
The following 5 figures show the evolution of the atmosphere over North America, October 12-16, 1954. These images are snapshots in time (11 p.m. EDT each day) at the 700-millibar pressure level (approximately 10,000 feet). The contour lines on these maps can be interpreted as a flow of air at that level, where lines that are closer represent winds that are stronger. On October 12-13 Hazel is well-removed to the southeast while a strong stream of air flows across much of Canada and the northern United States. On October 13 a weak trough develops near the west coast (red dashed line). This trough migrates eastward and becomes more pronounced over the next couple of days (October 14-15), eventually extending from the Great Lakes to Texas. Meanwhile, Hazel is still approaching the US east coast. Between Oct 14-15 a pronounced ridge develops over Atlantic Canada (blue dashed line). With Hazel approaching the US coast between the trough and the ridge, the storm is forced to accelerate northward.


Oct. 12
H
L


Oct. 13
H
L

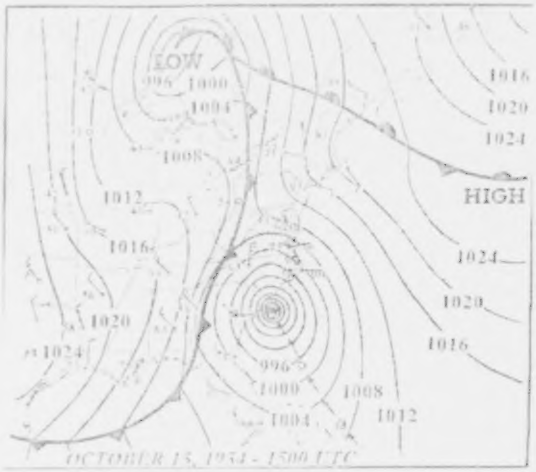

Oct. 14
H
L





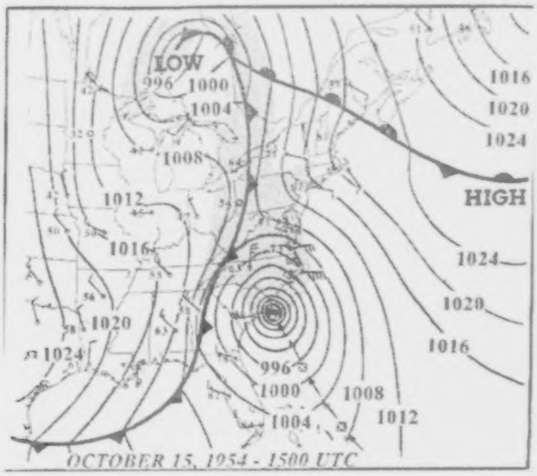
A lot happens in the final 24-hours between the last two maps. The trough continues "digging" southward while the ridge over Atlantic Canada amplifies greatly. The development strengthens the northward flowing airstream over the eastern continent while also setting up the potential for a strong storm system to form somewhere near or south of the Great Lakes. Hazel moves inland and begins dying, as all tropical cyclones do when they move over land and are cut-off from their oceanic energy source. However, the dying process isn't immediate and can take more than a day for a powerful hurricane like Hazel. The decaying remnants of Hazel move rapidly northward in the strengthening flow between the trough and ridge, arriving south of the Great Lakes about the same time that an extratropical cyclone was in the process of forming. The result was not unlike throwing kerosene on a newly-formed fire: an explosive atmospheric reaction. The following three weather maps show the rapidity with which Hazel reacted with the trough on October 15.

1. This map (from NOAA) shows the surface pressure lines and weather features over North America at 11 a.m. EDT. Hazel is about to land in the Carolinas while a cold front extends from Ontario (just east of Toronto) down to the Gulf of Mexico. The shaded area depicts rainfall, which can be seen to connect from Hazel all the way to an area of low pressure north of Lake Superior.


LOW
996
1000
1004
1008
1012
1016
1020
1024
1016
1020
1024
HIGH
1024
1020
1016
996
1000
1004
1008
1012
OCTOBER 15, 1954 - 1500 UTC

1 - October 15, 1954 - 11:00 a.m. EDT (courtesy NOAA)

1. This map (from NOAA) shows the surface pressure lines and weather features over North America at 11 a.m. EDT. Hazel is about to land in the Carolinas while a cold front extends from Ontario (just east of Toronto) down to the Gulf of Mexico. The shaded area depicts rainfall, which can be seen to connect from Hazel all the way to an area of low pressure north of Lake Superior.


LOW
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HIGH
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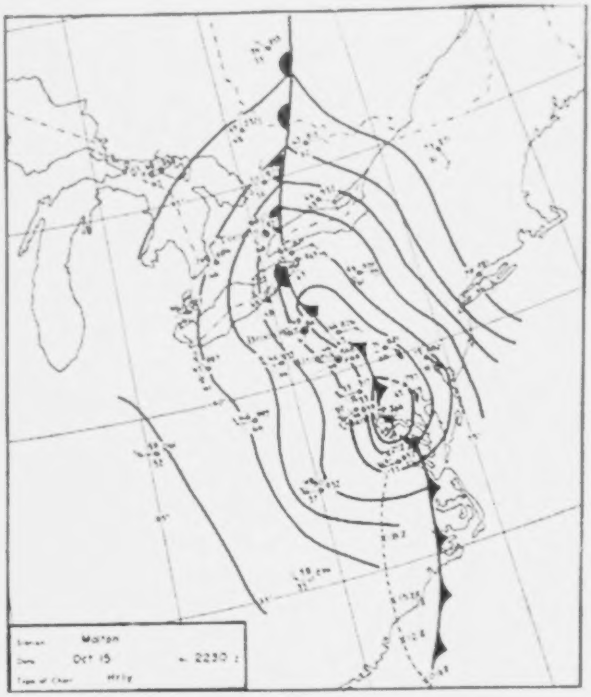
1000
1004
1008
1012
OCTOBER 15, 1954 - 1500 UTC

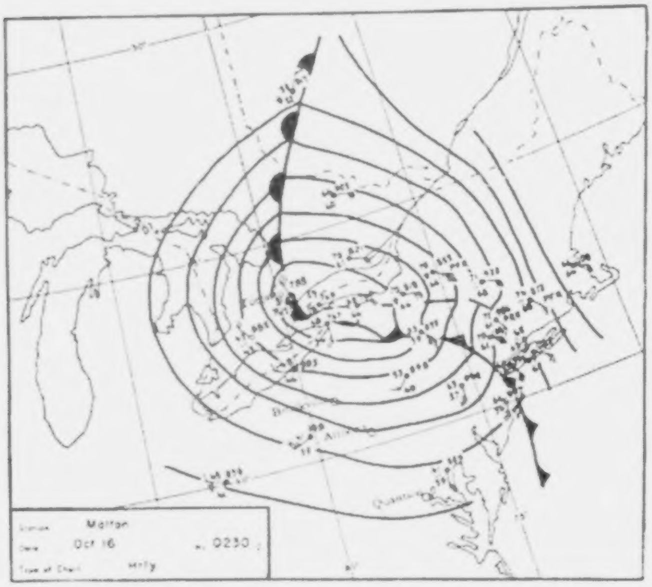
1 – October 15, 1954 – 11:00 a.m. EDT (courtesy NOAA)

2. The next two maps (from Knox) show a zoom into the area near the Great lakes. The first map from 6:30 p.m. EDT shows the position of the front (still near Toronto) and the elongated area of low pressure . . . with the dying centre of Hazel I still evident. When the cold front entered western Ontario near Windsor it was advancing eastward about 40 km/h. Thunderstorms along the front pushed rain through southwestern Ontario, saturating the ground. The evolution of the atmosphere caused a rapid deceleration of the front such that by the time it reached Toronto it came to a complete standstill. Toronto was getting drenched, and Hazel had yet to arrive.



#2– October 15, 1954 – 6:30 p.m. EDT

3. The map from 10:30 p.m. EDT shows a more consolidated storm centre in the pressure pattern over the western end of Lake Ontario. This is Hazel II.



#3– October 15, 1954 – 10:30 p.m. EDT

Hazel II passed directly over Toronto near midnight, Oct 15-16, as evidenced by the contrasting weather between Malton Airport (now, Pearson International Airport) and Toronto City Centre. At midnight, Malton reported west-southwest winds while the Toronto Island reported east winds. Similarly at midnight, while Malton was reporting 8°C the Bloor Street weather office was reporting 16°C. This remarkable contrast pinpoints the storm centre over Toronto exactly at midnight. The airport remained in the cold air west of the centre with the temperature rising to no higher than 11°C while the wind backed in direction from northwest to west-southwest. On the other hand the storm's warm sector moved over the city with the wind veering from north through east while the temperature climbed to 17°C. Knox pointed out that the structure and behaviour of the storm that hit Toronto was much different than the one that existed earlier that day.

Extratropical Transition

An explanation of *extratropical transition* is in order; it is the process by which tropical cyclones transform into extratropical cyclones. Extratropical cyclones are the common low pressure centres which form along fronts in mid latitudes. They draw their energy from the imbalance that takes place when cold and warm air move into close proximity: greater temperature differences over shorter differences result in more intense frontal storms, or extratropical cyclones. Tropical cyclones—such as hurricanes—on the other hand, are warm air storms which draw their energy from the release of latent heat . . . the process when evaporated ocean water rises in the atmosphere as water vapour and subsequently condenses back into rain. This process releases heat into the centre of an already warm storm, making it warmer, and hence, more intense.

What happens when a tropical cyclone moves into the cooler and windier environment of the mid latitudes is a great forecast challenge and a focus of considerable scientific investigation since the mid 1990s. Tropical cyclones undergoing extratropical transition change structure, size, and intensity. The resulting cyclone—known now to meteorologists as ET storms—can be weaker or more intense than the incipient tropical cyclone, depending on the timing or phasing of a number of atmospheric components.

ETs are an ongoing concern for Canada in that they are amongst the most difficult meteorological forecast challenges and they can bring a surprising severity of weather. Typically, ETs are cyclones which would have likely formed anyway, but the injection of strong tropical ingredients, such as the strong low-level rotation of the atmosphere and the high moisture content and rainfall, make them more potent than they would have otherwise been. Hazel was a dramatic example of a powerful ET.

To give an appreciation of the forecast challenges with ETs, consider Hurricane Ivan from September 2004. The rainfall and upper atmospheric moisture from a dying Ivan (inland over Tennessee) fed northward into a developing storm over eastern Canada. The result was a much more intense storm system over Atlantic Canada than would likely have developed, with Newfoundland waters experiencing hurricane force winds and fatalities. Meanwhile, the lower atmospheric rotation of Ivan drifted back southward, through Florida, into the Gulf of Mexico, where it regenerated back into Tropical Storm Ivan, creating dangerous conditions all over again along some US Gulf coasts.

Rainfall and Flooding

Rainfall over Southern Ontario associated with Hurricane Hazel was very intense, yet the cause of the severe flood was not solely the blame of Hazel. Residents recalled that the two weeks leading up to Hazel were the wettest they could remember.

Drainage basins were saturated; therefore, when Hazel dropped the record amount of precipitation on the region, water ran off the surface directly into streams and rivers. Toronto is dissected by rivers and streams and in 1954 many people lived on the city's floodplains, placing them directly in the path of the Hazel flood. Flooding occurred from Highland Creek in the east to the Credit River in the west. The Humber River, Highland Creek, Don River, Etobicoke Creek, Credit River, and 16 Mile Creek all overflowed their banks.

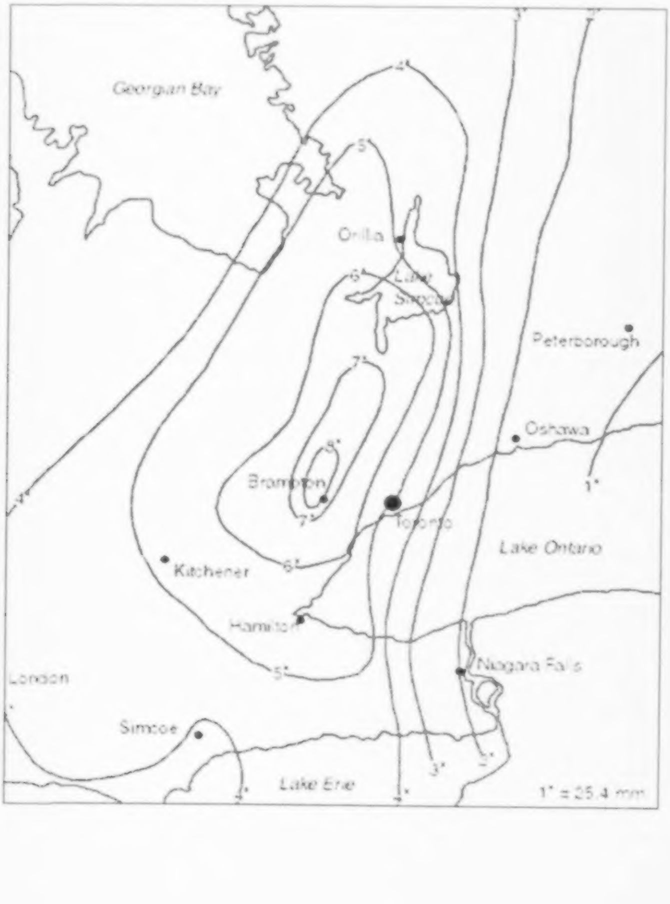
Reported rainfall amounts were:

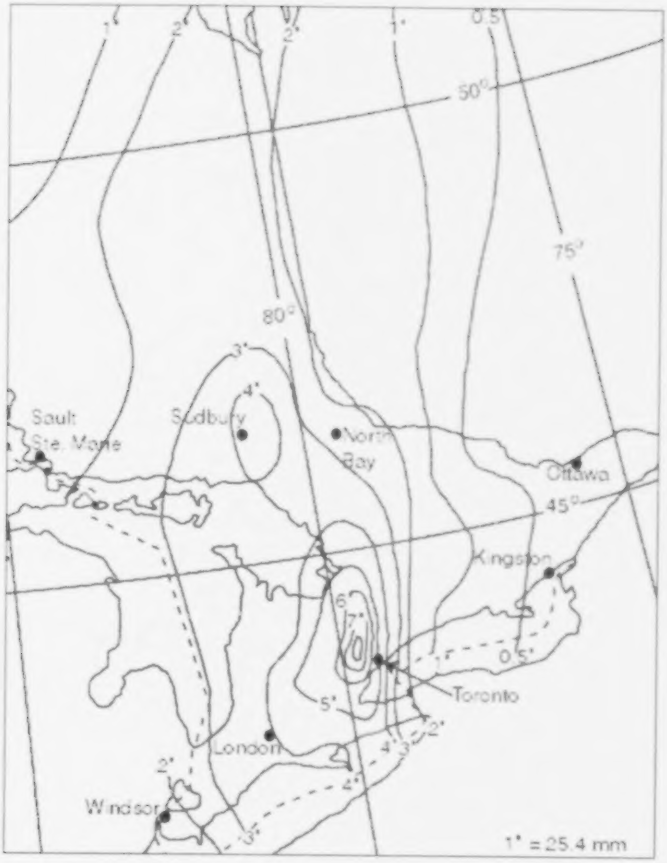
Malton airport 5.9 inches [150 mm] in 12 hours until 1:30 a.m. (Kennedy)

Toronto 7.2 inches [183 mm] 24 hours (Kennedy)

- 3 inches [76 mm] east, south of the Danforth
- 3.5 inches [90 mm] east of University
- 5 inches [127 mm] in Weston and Islington (TS, Oct 23, 1954)

The two maps below show Hazel's rainfall over Ontario (from Mason).


Georgian Bay
4"
5"
Orillia
6"
Lake Simcoe
Peterborough
7"
Oshawa
8"
Brampton
1"
7"
Toronto
Lake Ontario
Kitchener
6"
Hamilton
Niagara Falls
London
5"
Simcoe
3"
2"
Lake Erie
1" = 25.4 mm



Brampton received the greatest concentration of precipitation as this was where the cold front and Hurricane Hazel began to merge. Brampton received 8 inches [203 mm] in 48 hours, falling on land in the upper west end of the Humber watershed and the upper reaches of the river system itself, flowing 500 feet [153 m] down into the Humber River Valley. An escarpment approximately the same elevation runs north from Brampton parallel to the Humber River and also received heavy rains, which were funneled into the river. The east side of the river from the Barrie highway to Woodbridge has a similar slope with a drop of 250 feet [76.2 m].

The Humber river experiences a drop of 1200 feet [366 m] between the furthest headwaters and the shores of Lake Ontario, so as water rushed overland in the Brampton area into the river, the river level rose 20 to 30 feet [6 – 9 m] in some areas and raced down the river over the course of the next several hours at speeds up to 50,000 ft^3/s [1416 m^3/s].

The flood hit Woodbridge first, but was waylaid by a bridge, which acted as a temporary dam. When the bridge failed to hold back the floodwaters, flooding cascaded down the river valley occasionally slowing at other bottlenecks, but hitting communities with tremendous force. There were only four dams on the Humber prior to Hazel and none were built for flood control purposes. Consequently, they may have held back a negligible amount of water but failed to have much effect. Two of the dams, Bolton and Woodbridge, were opened entirely and two, Pine Grove and Palgrave, were partly washed away.

The reason for the severity of the Humber flood was explained by Robert Campbell in the Toronto Star on October 16, 1954. "The Humber River rises in the Peel Plains about 70 miles [113 km] north of Lake Ontario. The plains have a hard clay base and any heavy rainfall rushes off almost immediately. The Humber River takes it all." The Humber River is approximately 300 mi^2 [777 km^2] in area and received 9 inches [229 mm] of rainfall. One inch of rain on one square mile of land equals 14.5 million gallons of water; for the entire watershed, approximately 40 billion gallons [151 billion litres] of water fell during Hazel or 200 million tons (Kennedy). "It was like dumping a lake the size of Lake Simcoe on the Humber River drainage area and having it all trying to get out by way of the river at once," Turnbull told the Toronto Star (October 23, 1954). The Toronto Star reported that 65 billion gallons [246 billion litres] of rain fell on the combined Don and Humber watersheds.

Weather Bulletins

Was Toronto properly warned about Hurricane Hazel? Special Weather Bulletins were issued by the Dominion weather office in Malton, however, many of the city's residents did not take protective measures as is evidenced by the loss of life and widespread damage.

Norman Grundy, a meteorologist at the Dominion Weather Office, developed a prognostic chart Friday morning that showed Hurricane Hazel over eastern Lake Ontario by 2300 on Friday October 15, 1954, contrary to American meteorologists' predictions that the storm would dissipate over the Allegheny Mountains. A forecast was issued at 9:30 a.m. calling for continuous rain throughout Friday and into the night, but Hazel was expected to lose strength as it crossed over the interior of the United States. Forecasters were also watching a cold front located west of Hazel's projected track, recognizing that if the two systems combined, the rainfall would be more severe. Fred Turnbull, head of the weather office at Malton, issued a statement to the Telegram newspaper in which he stated that the rain they were expecting, "could be the heaviest ever recorded in the city's history," exceeding the rainfall in 1887 that dropped close to four inches [101.6 mm] of rain. (Kennedy, 1979)

Turnbull's post-Hazel report summarizing the weather office's handling of the storm stated, "The issuing of a weather bulletin, particularly advising of the approach of a hurricane, is a serious step and not to be taken lightly. Since storms of this nature seldom follow our predicted course, and rarely travel 700 miles [1100 km] overland retaining sufficient energy to be alarming, we decided to consult our Central Analysis Office in Montreal before issuing a special bulletin. In a telephone call to Montreal, Mr. Leaver of the Central Analysis Office agreed to have his staff give special consideration to Hurricane Hazel, and call us immediately after completion of their prognostic chart." (Kennedy, 1979; p. 37)

After consulting with the Central Analysis Office, a Special Weather Bulletin was issued over a private teletype network, by telephone to local radio stations and to commercial interests that had identified themselves on a severe weather call list. The information was also sent to Marconi stations so that vessels on the Great Lakes could be warned of the approaching storm.

Special Weather Bulletin

"Hurricane Hazel moved inland near Myrtle Beach, South Carolina, this morning. Highest winds are estimated at 100 miles per hour [161 km/h] over a small area, with winds of 40 to 60 miles per hour [64 – 97 km/h] extending 80 miles [129 km] to the North and East and 40 miles [64 km] to the South and West of the centre. Hurricane Hazel is expected to continue at 35 to 40 miles per hour [56 – 64 km/h] towards the Northwest for the next few hours, then to follow a more northerly course.

"Shipping interests on Lake Erie and Lake Ontario should take precautions against the possible occurrence of winds of 40 to 70 miles per hour [64 – 117 km/h]." (Kennedy, 1979; p. 38)

A second bulletin was issued around noon on Friday that read,

"Hurricane Hazel moved inland just east of Myrtle Beach, South Carolina, at 9:15 Eastern. At 11:30 it was centred 30 miles [48 km] west of Wilmington, North Carolina, and moving Northward with a speed of 30 miles per hour [48 km/h].

"The hurricane is expected to continue on its Northerly course, reaching the Eastern end of Lake Ontario about midnight tonight. In crossing the Allegheny Mountains the hurricane will decrease markedly in intensity with winds not expected to exceed 50 miles per hour [80 km/h] on the open water of Lake Ontario." (Kennedy, 1979; p. 39)

Turnbull spent much of the afternoon and evening fielding calls for interviews from local media regarding the approaching storm and conducted four radio broadcasts to advise the public that Hazel would reach Toronto Friday night. The weather office's switchboard registered on average one call every 20 seconds for a total of 2,300 calls.

At 9:30 p.m. the final official forecast on the storm was issued by the weather office and read as follows:

> **Synopsis:**
>
> Hurricane Hazel, which moved in on the North Carolina Coast Friday morning, continued to move northward and to accelerate during the day, and by 9:00 p.m. was centred between Buffalo and Rochester.
>
> The intensity of this storm has decreased to the point where it should no longer be classified as a hurricane. This weakening storm will continue northward, passing east of Toronto before midnight. The main rainfall associated with it should end shortly thereafter, with occasional light rain occurring throughout the night. Winds will increase slightly to 45 to 50 MPH [72 – 80 km/h] until midnight, then slowly decrease throughout the remainder of the night.
>
> Lake Ontario and Niagara Regions
> Toronto and Hamilton Cities
>
> Rain tonight. Cloudy with occasional showers Saturday. Little change in temperature. Winds north 40 to 50 [64 – 80 km/h] this evening decreasing overnight to northwest 30 Saturday. Low tonight and high Saturday at Toronto, St. Catherines, and Hamilton, 45 and 55 [7 and 13° C]. Outlook for Sunday cloudy and cool.

Timeline of Storm Events

An exact timeline of events associated with Hurricane Hazel is difficult to construct because of the speed of the flood and the many deaths. The worse flooding in Toronto occurred after the rain had stopped because the heaviest rainfalls occurred in the upper regions of the river basins, creating a delay before floodwaters reached the populated floodplains in the city. The flood was also slowed by temporary dams that formed along the rivers. Hurricane Hazel inspired a revolution in Toronto regarding conservation and floodplain management. Toronto and Region Conservation (TRCA) was formed and spearheaded the campaign to expropriate floodplain land and return it to the river. The authority had planned to build dams on the rivers, but the cost of purchasing the land exceeded projections and halted the development of all but four dams. The severity of Hurricane Hazel provided the impetus to make the sweeping changes in river policy that was evidenced in the Toronto area and in the provincial and federal governments.

Friday October 15, 1954

Throughout the day the Dominion Weather Office tracked Hurricane Hazel consulting with specialists in the Central Analysis Office to verify the accuracy of their predictions and assist in the wording of weather bulletins that were issued. Information was disseminated from the office throughout the day and the Chief Meteorologist, Fred Turnbull, provided many interviews to local radio and print reporters. Few people had personal knowledge of hurricanes and the associated impacts; therefore, they did not act accordingly. Toronto Hydro called in standby crews to cope with the possibility of power outages due to predicted strong winds and rain.

By 4:30 p.m. - as the storm was located over New York and Pennsylvania heading directly for Toronto - rain began to fall heavily resulting in traffic problems in the evening rush hour. Underpasses began to collect water complicating the evening commute, however, by 7:00 p.m. Hazel had pushed the cold front to the west side of the Humber River and the weather cleared over Toronto, Etobicoke, and Weston and the city was rather peaceful. Toronto Hydro actually contacted the weather office to ask if the worst of the storm was over and they could send their crews home. Turnbull told them, "The worse is yet to come. This is the pause that always comes during a hurricane. The wind and rain will reach their peak by 11:00." (Kennedy, 1979)

Highways began to suffer washouts by 9:00 p.m. Between Bradford and Toronto, Highway 11 was cut in six places by the floodwaters and throughout the region creeks were forming where they never had before as water flowed over land to the rivers. Highway 400 heading north from Toronto was dissected near Bradford in the Holland Marsh area.

Residents of the community of Long Branch, situated where Lake Ontario meets Etobicoke Creek, were more versed in flooding because of the annual spring floods; therefore the flats began to be evacuated at 10:30 p.m. and the trailer park in Long Branch began evacuations at 11:00 p.m. Toronto experienced strong winds at this time with reports of trees downed.

Woodbridge, which was built in an area where the river widens, was the first community on the Humber to flood. A bridge acted as a temporary dam, halting the flow of water for a brief period, but when the bridge failed the flood would cascade down the river. The first deaths were reported at 11:00 p.m. as a car was flooded in Woodbridge into the Humber River killing the occupants. A child was torn from his father's arms on a bridge and drowned.

The water in Holland Marsh rose steadily in the early evening with residents braving the rain to shore up weak locations on the dike or increase the elevation of the dyke. Shortly thereafter the effort was abandoned and residents evacuated the marsh. By 11:30 the DePeuter house was afloat on the newly formed lake. The house would stay afloat with the family inside until approximately 6:30 a.m.

By 12:00 a.m. the storm was mostly over in Toronto. Police received their first call for outside assistance from Weston at 12:50 a.m. and at this time water levels in the Humber River were rising rapidly in Weston and communities further south. Between Thistletown and Scarlett Road the Humber drops 25 feet [7.6 m], yet Raymore Drive residents on this steep slope refused to believe that they should be worried. Many Raymore Drive residents were in bed when the flood crest arrived in their community at approximately 1:00 a.m.

Response from the police was complicated by the flood's effects on the landscape. It became more difficult to locate houses and one police cruiser contacted dispatch with the message, "We can't see that house with people on the roof that you sent us to find, near the Weston area."

The reply from another police cruiser was, "Tell him to move about 600 yards south, that's probably the one I saw floating past a few minutes ago. They'll be about 600 yards south by now." (TS, October 16, 1954)

Currey Bulmer, the owner of a marine store on Bathurst Street was awakened by police at 2:00 a.m. and asked to open his store to provide boats for the rescue operations taking place around the city. Fifty boats were contributed to the search and rescue efforts and Bulmer received a police citation for his contribution.

Saturday October 16, 1954

The Toronto Star reported that 30 people had died in the floods following Hurricane Hazel, including between 11 and 19 in Woodbridge and five firemen from Etobicoke. Another 300 people were listed as missing and damage was expected to be in the millions. The Metro Chairman, Frederick G. Gardiner, immediately requested provincial and federal assistance to cope with the aftermath of Hazel. The scope of the disaster that had befallen the city had not yet been realized because the final totals would include 81 dead and damage at close to $100 million. The largest death toll would be realized on Raymore Drive where 35 people were killed as a result of the Humber River rising rapidly and with immense force ripping entire homes from their foundations and washing them downstream.

Concerns raised about the safety of the city's water supply were laid to rest after testing proved that the water was safe for consumption, however, a pumping station in Oriole had broken down and Aurora was ordered to boil water as a precaution against bacterial contamination.

Members of the navy contributed to rescue efforts throughout the night and were joined by militiamen the next day. Militia searched the flooded areas for two weeks looking for victims of the flood and burning debris to help clear the river.

Monday October 18, 1954

Search parties were forced to cut apart piles of debris or use flamethrowers as they searched for bodies.

Plans were underway to pump the floodwaters from Holland Marsh. Engineers thought they would have to sacrifice the west side to save the larger east side of the marsh. Pumps were brought in from a mining company and Ontario Hydro.

The Hurricane Relief Fund was formed to collect donations from people in Toronto, across Canada, and around the world who wished to make donations to the flood victims. The goal of the fund was to raise $10 million to cover uninsured damages.

Tuesday October 19, 1954

The Toronto Star reported that Prime Minister St. Laurent asked that a Royal Commission be initiated to investigate Hurricane Hazel damages, which would help the Federal Government determine the amount of federal aid to be sent to the region. Meanwhile the Ontario Premier requested that federal assistance be calculated similar to aid packages offered to Manitoba and Quebec, with most of the money going to rehabilitate buildings and properties, allowing money from the newly formed relief fund be used for people. Housing would remain the responsibility of the municipal authorities.

November 1, 1954

A two-person Royal Commission found that damages from Hurricane Hazel were less than $100,000,000, with $10,000,000 to $12,000,000 resulting from damage to personal belongings and household effects, whereas, the total cost included the soil erosion and other effects of a flood of Hazel's severity.

Colonel John Housser recommended that no more militia operations be formed to assist in cleanup from the flood.

November 8, 1954

Hazel caused a housing crisis in Toronto with 180 houses destroyed, 1175 houses seriously damaged, 801 houses damaged, 16 trailers destroyed, and 169 trailers damaged. A central housing registry was created to help assist flood victims find accommodation.

November 11, 1954

The Holland Marsh was drained of water including the western section that was to be left underwater. The operation was completed 11 days ahead of schedule.

November 22, 1954

Hogg's Hollow Bridge, damaged in Hurricane Hazel, collapsed.

April 15, 1955

Transportation snarled in the city because a bridge damaged in Hurricane Hazel had to be reduced to one lane so the bridge could be relocated and extended. The snapping of a chain holding the bridge in place necessitated the procedure.

May 14, 1955

The federal government announced plans to investigate flood warning systems. The creation of parkland from the Hazel floodplain necessitated the appointment of a Park Commission.

July 8, 1955

The bridge over the Humber River on Highway 401 reopened after damage inflicted from Hurricane Hazel.

July 28, 1955

Two families were removed from properties when they refused to leave despite a judge's order. The property owners were demanding a larger compensation package for their land.

August 11, 1955

The Long Branch authorities considered constructing storm sewers for every street; the rapidly growing development north of the community would increase the risk of flooding (increased development increases the speed that runoff reaches the river, thereby reducing the time interval between rainfall and peak discharge in the river).

November 21, 1958

The Black Creek was altered to run above a sewer line, where the creek runs through the Lambton Golf course.

December 6, 1958

TRCA proposed a flood control plan combining land expropriation, and dam and reservoir construction titled *Plan for Flood Control and Water Conservation*.

June 20, 1959

Metro Council approved the TRCA plan.

April 22, 1961

The federal government agreed to support the plan.

1964

The Clairville Dam was completed on the West branch of the Humber River.

November 21, 1968

Developers applied directly to the Ontario Municipal Board to floodplain land in an attempt to circumvent the TRCA. They would ultimately be denied.

October 18, 1968

The Milne dam on the Rouge River was completed. It was the fourth dam completed. Others built were the Clairville dam on the west branch of the Humber River, the Black Creek dam at Jane Street and Sheppard Avenue, and the Stouffville dam and reservoir on the west branch of Dufferin Creek.

1973

The G. Ross Lord Dam on the West branch of the Don River was completed.

FATALITIES

The official death toll for this storm is 81 people. Various other statistics report between 80 and 83 deaths. Two names are missing from this list but are believed to be the storm orphan's grandmother, name unknown, who was visiting at the time of the flood and possibly Mr. and Mrs. Crymble's daughter who was reported missing with her parents, but not confirmed dead in the follow-up newspaper reports of fatalities. The majority of the people on this list were drowned in the flooding rivers. Raymore Drive experienced the most casualties with 35 people dead on one street. Two other notable tragedies that stirred the emotions of the communities impacted by the floods and beyond were the Storm Orphan and the deaths of five firemen from the Kingsway-Lambton fire station. Nancy Thorpe was the sole survivor of her family, which consisted of her parents and older brother. Five firemen were drowned when they were responding to a call for help from people trapped in their car along the flooding Humber River.

1. Auger, George – 22 – Hull, Quebec - electrocuted in Ottawa
2. Babbidge, Claude – Raymore Drive, Etobicoke – drowned
3. Boyd, James – 84 – 140 Raymore Drive, Etobicoke - drowned
4. Brasz, Albert – 48 – Weston - drowned
5. Brough, Helen – 80 – Raymore, Drive, Etobicoke – drowned
6. Clarke, John T. – 26 – O'Connor Drive – drowned at Woodbridge
7. Collins, Clarence – Etobicoke Deputy Fire Chief – drowned
8. Crymble, Ed – 35 – 13 Island Road, Long Branch – drowned when their home was swept into a lake
9. Crymble, Mrs. Ed – 34 – 13 Island Road, Long Branch – drowned

10. Curtis, Annie – 75 – Fairglen Crescent, Weston – drowned
11. Deadder, Clyde – 19 — Thistletown – drowned in Humber
12. Deadder, Murray – 23 – Thistletown – drowned in Humber
13. Drysdale, Jerry – 23 – drowned in Woodbridge in the Humber
14. Edgar, Charles – Baxter, Ontario – drowned at Beeton in the Boyne River
15. Edwards, Kenneth – 27 – 248 Raymore Drive, Etobicoke – drowned in Humber
16. Edwards, Mrs. Joan – 27 – 248 Raymore Drive, Etobicoke – drowned in Humber
17. Edwards, Caroline – 3 – 248 Raymore Drive, Etobicoke – drowned in Humber
18. Edwards, Frank – 2- 248 Raymore Drive, Etobicoke – drowned in Humber
19. Edwards, John – 3 months – 248 Raymore Drive, Etobicoke – drowned in Humber
20. Gamble, Frederick W. – Shelburne – drowned at Woodbridge
21. Gillan, George – 144 Raymore Drive, Etobicoke – drowned
22. Gillan, Helen – 144 Raymore Drive, Etobicoke – drowned
23. Girodat, Paul – 31- Raymore Drive – drowned in Humber
24. Hall, Kenneth – 53 – 140 Raymore Drive, Etobicoke – drowned
25. Haugh, Jack – 72 – Beeton – drowned in Boyne River
26. Haugh, Charles O. – 41 – Egbert, Ontario – drowned at Beeton in Boyne River
27. Haugh, Mrs. Charles O. – 41 – Egbert, Ontario – drowned at Beeton in Boyne River
28. Henderson, James – 62 – Selby or Kingston – killed in auto crash near Deseronto
29. Hodgson, Wayne – 7 – London, Ontario – drowned
30. Jeffries, Edward Albert – 69 – 143 Raymore Drive, Etobicoke – drowned in Humber
31. Jeffries, Elizabeth – 143 Raymore Drive, Etobicoke – drowned
32. Jeffries, Mrs. Thomas Sr. – Raymore Drive, Etobicoke – drowned
33. Johnston, Mrs. Robert – 47 – Long Branch – drowned
34. Joyce, Frank J. – 19 – Athlone – killed in auto crash near Brampton when car fell into a cave-in on highway 7

35. Joyce, Irving – 20 – Beeton – drowned in car between Toronto and Beeton in Boyne River

36. Lanning, Bruce – 10 – Oshawa – drowned at Unionville when he was swept from his father's shoulders

37. LeBlanc, Alice – 140 Raymore Drive, Etobicoke – drowned

38. McCallum, Gordon – Palmerston – burned in Southhampton train wreck

39. McGarvey, Philomena – 45 – 152 Raymore Drive, Etobicoke – drowned

40. McGarvey, Jacqueline – 9 – 152 Raymore Drive, Etobicoke – drowned

41. McGarvey, Donald – 17 – 152 Raymore Drive, Etobicoke – drowned

42. Mercer, Frank – Etobicoke fireman – drowned

43. Neil, Mrs. Jean – 25 – 148 Raymore Drive, Etobicoke – drowned

44. Neil, Adele – 1 – 148 Raymore Drive, Etobicoke – drowned

45. Neil, Susan – 3 – 148 Raymore Drive, Etobicoke – drowned

46. Neil, Darlene – 4 – 148 Raymore Drive, Etobicoke – drowned

47. Newing Gerald – 136 Raymore Drive, Etobicoke – drowned

48. Newing, Katherine (his mother) – 136 Raymore Drive, Etobicoke – drowned

49. Newing, Gerald Jr. – 136 Raymore Drive, Etobicoke – drowned

50. Nicholson, Steward – Palmerston – fatally injured in Southhampton train crash

51. Oliver, Roy – Etobicoke fireman – drowned

52. Palmateer, Dave – Etobicoke fireman – drowned

53. Peasley, Lambert – 140 Raymore Drive, Etobicoke – drowned

54. Peasley, Doris – 140 Raymore Drive, Etobicoke – drowned

55. Peasley, Sylvia – 18 – 140 Raymore Drive, Etobicoke – drowned

56. Perry, Della – 50 – Lansing – drowned at Woodbridge

57. Radley, Dianna – 8 – Woodbridge – drowned

58. Radley, Bobby – 5 – Woodbridge – drowned

59. Reid, Donald – 29 – Woodbridge – drowned

60. Reid, Mrs. Donald – Woodbridge – drowned

61. Reid, Dallas – 7 – Woodbridge – drowned

62. Ryan, Charles – 32 – 61 Fairglen Crescent, Weston – drowned

63. Sauer, Mary – 53 Mattice Avenue, Etobicoke – drowned

64. Salt, Vera – 136 Raymore Drive, Etobicoke – drowned

65. Small, Angus – Etobicoke Fireman – drowned

66. Smith, Jack Sr. – 69 – Raymore Drive, Etobicoke – drowned

67. Smith, Grace – 65 – Raymore Drive, Etobicoke – drowned

68. Smith, Jack Jr. – 30 – Raymore Drive, Etobicoke – drowned

69. Summers, George – 75 – Deseronto – killed in an auto crash near Deseronto

70. Thorpe, Clifford - 27 – Island Road - Long Branch – drowned

71. Thorpe, Patricia - 27 – Island Road - Long Branch – drowned

72. Thorpe, Robert – 2- Island Road – Long Branch - drowned

73. Topless, Al – 29 –- 136 Raymore Drive, Etobicoke - drowned

74. Topless, Anne – 26 – 136 Raymore Drive, Etobicoke – drowned

75. Trimble, Mrs. Marlon – Port Credit – drowned in Credit River

76. Van Gelder, Lou – 21 – Fairglen Crescent drowned

77. Wicks, Mrs. Nora – 45 – Aylmer – drowned in Aylmer Creek

78. Wilson, David – Weston – drowned in Humber

79. Wilson, Lewis (his father) – Weston – drowned

COMMUNITY IMPACTS

Hurricane Hazel impacted people and communities throughout Toronto and Southern Ontario when it struck the night of October 15, 1954. Rivers were inundated by the heavy rainfall, their waters rose rapidly, and barrelled with tremendous force down the river valleys. The rapid flooding caught many area residents by surprise as they had no recollection of floods of Hazel's magnitude, so despite repeated warnings regarding the amount of rain expected, residents were unable to imagine how that might affect them. Many people were drowned escaping from their homes, washed off roads, or down the river still in their homes. The hardest hit communities were the Holland Marsh, Raymore Drive and Woodbridge on the Humber, and Long Branch on Etobicoke Creek. Impacts were distributed throughout communities in Southern Ontario such as Barrie, Beeton, Hamilton, and Oakville; and even as far away as Ottawa.

Toronto contains many bridges to facilitate transportation around the city. Bridges were hardest hit by the floods because as floodwaters rose in the river, debris, entrained by the rushing waters, were forced against the abutments of area bridges, eventually either destroying the bridge or rendering it unsafe. Bridges acted as temporary dams, which increased the force of the water when it broke through the dam and continued downstream. Roads and railway lines suffered washouts north of the city causing traffic delays and deaths. Several people were swept through washouts and off bridges into the swollen rivers. Some were rescued and others drowned. The accuracy of the weather forecasts prevented more damage to boats in the lake because mariners typically heed weather warnings. Damage was sustained to area marinas because of the strong winds and the floodwaters.

Holland Marsh

The Holland Marsh was flooded when between 4 and 20 feet [1.2 – 6.1 metres] of water backed up from Lake Simcoe into the marsh. The south and west ends experienced the worst flooding when between 20 and 30 feet [6.1 – 9 metres] of water backed up from the bordering Holland River and Schomberg Creek into the marsh. Highway 400 which dissects the marsh was under five to ten feet [1.5 – 3 metres] of water and the hamlet of Ansnorveldt was inundated. Approximately 1000 people were rescued from the north end of the marsh towards Bradford, while hundreds more were stranded throughout the night on high ground until rescue boats could be launched. Severe economic losses were experienced because while much of the year's crop had been harvested, it had not been brought in and was submerged by floodwaters.

The nature of the flood in the Holland Marsh differed from that in the narrower river valleys in Toronto. The Holland Marsh flood was characterized by Charlie Davis, a local resident; "It wasn't like down by the Humber where there was a big rush of water. The water was really quiet and it was so dark outside you couldn't really see what was going on. But every time you looked out the door, the water had risen another six inches." (TS, October 14, 1984)

Holland Marsh is located in a bowl shaped valley. John Van Dyke, a Holland Marsh resident, describes the Hazel flood:

> "Then came October 15, the day that it did not rain, but poured all day long. There was no let-up and by late afternoon the soil was completely saturated. The drainage river within the boundary of the Marsh was overflowing, as were the drainage ditches, and water spilled over on some of the low-lying fields. The highlands surrounding the Marsh could not absorb all this rain, and since the land

> slopes down towards the Marsh the drainage canal was filling up fast, the water pressing against the dikes.
>
> "By early evening came the danger point. Water had reached the top and in some places came over the top and all able-bodied men were summoned to come out to sandbag weak spots. But the water rose so rapidly, these efforts were soon abandoned and the people were told to get out and go to higher ground.
>
> "So most of the residents did just that and made their way to the town of Bradford which is located high on a hill an average five miles distant. People just poured into the little town–a real invasion. If there was a showing of real community spirit, an effort to help a neighbour in need, in the history of the town of Bradford, then it was on the night of October 15, 1954." (Kennedy, 1979; p. 98)

Allan Anderson, a CBC broadcaster described the scene in the Holland Marsh when he arrived: "It was unbelievable, the Marsh was just one vast lake. All you could see in the distance sticking out of the water was the steeple of the Springdale Christian Reform Church (see photo). In Bradford itself it was like a war zone. The flood victims had been taken into people's homes and the town was bursting at the seams. The town hall was full of people sleeping, crowded so close together you thought that they were almost sleeping standing up." (Kennedy, 1979; p. 101)

Most of the properties were inundated with water, destroying or seriously damaging the homes and contents. John Van Dyke describes the damage in the marsh: "Many too were either ruined or badly damaged and furniture beyond repair. This was especially true on the Springdale side, west of Highway 400, where the water rose as high as fifteen feet, flowing clean over the highway. Two or three homes were lifted off their foundations and set afloat. They travelled for about a mile, coming to rest against a highway. One of these homes even contained an entire family." (Kennedy, 1979; p. 102)

The DePeuter family spent the night stranded in their house as it floated around the marsh. The house was flooded up to the windows of the first floor, so the parents, 13 children and one cat fled to the second floor, where they remained all night as the house floated for two miles around the marsh. Three of the children became sea sick as the house 'bobbed like a cork.' Hydro remained connected to the house for the first 15 minutes.

Henry DePeuter describes the night he and his family were adrift on the marsh:

> "The amazing part was all the lights in the house stayed on, because we were moving towards the hydro lines, and they were slackening.
>
> "The house just took off like a boat, a real Noah's Ark. From 11:30 till 6:30 we floated aimlessly through the

> Marsh, bumping into houses, greenhouses, barns, hydro poles, everything. The area over by the Holland River had a faster current and somehow our house got caught in that current and started spinning like a top, faster and faster, and rocking to and fro. We all–all fifteen of us–would run from one side of the house to the other when it tilted, trying to balance it out. One of my younger brothers, Bastian, actually got violently sea-sick.
>
> "Until then we had been too busy to really worry and then one of the younger ones asked if we were all going to die. My mother said that only one person knew that, the Lord, and we all knelt down and prayed, the Lord's Prayer. And we did get out of the current and finally come to rest against a service road near the 400, where a complete field of carrots had floated up to the surface and helped hold us in place. We were two and half miles away from where we started, with lots of side trips that had often taken us near our original place.
>
> "At that time there were still cars going along the 400 and we shouted and waved to attract their attention. I even fired off a .22, but with the noise of the wind and the water, it couldn't be heard. Then we waved bedsheets and motorists saw us, and soon an amphibious truck from Camp Borden came along. One man got out, tied a rope around his waist, and plunged in to swim towards our house. We were about 250 feet away and the water was pretty wild and cold but he made it. We knocked a window out downstairs and pulled him in. Then another man came along the rope in a canoe which kept tipping but he told us we'd be okay with the extra weight of two people in the canoe. So we made it out to the truck in seven trips, and were taken into Bradford, where we stayed in the Bradford Town Hall.
>
> "We never found out the name of the man who swam out with the rope to rescue us. Then one day my brother was in Barrie, in Jack Oates' paint store, and he got talking about the wet weather and how it wasn't as bad as Hurricane Hazel and one thing led to another and they found out that he, Jack Oates, was the man who had saved us." (Kennedy, 1979; p. 100-101)

After the marsh was drained of floodwater, the DePeuter home was moved back to its original foundation intact.

Every day during rescue operations in the marsh people journeyed from Bradford to the dykes overlooking the marsh to determine when they might be allowed to return to their homes. Their houses could be seen in the distance protruding above the floodwaters. A housing crisis developed because of the number of displaced residents of the marsh who required prolonged emergency housing. Hundreds of homes were condemned by the health department because of contamination from the floodwaters and rotting vegetables.

Seven thousand acres [28.35 km^2] of marsh area were turned into a lake by the flood, wrecking 500 homes and making 3000 people homeless. Early estimates of damages were up to $10,000,000, including more than 500,000 bags of onions and a nearly identical number of bags of celery, plus millions of bushels of other vegetables that were battered against buildings and left to float around the lake and rot.

Residents voted to block the draining of water from their properties so that the southeast section of the marsh could be drained of water. Art Vandyke, a resident of the submerged section was quoted as saying, "We have lost everything anyway. If the water could be taken down we might or might not have something to save. If the people to the east can save anything, leave our land under water for the moment!" (TS, October 18, 1954)

The western section of the marsh has a higher water level than the east because of the entry of the flooded Schomberg branch of the Holland River. The west drains to the east through a conduit that flows under Highway 400. Engineers decided to block the conduit to allow pumps to begin draining the eastern section. The time to pump the marsh dry was placed at weeks.

The local communities created 11 groups to handle the crisis in the area. Tasks included dealing with the homeless and removing objects from the marsh as the water level dropped. Trailers were considered to deal with the homeless because of the expected duration that emergency lodging was required.

Fifteen feet [4.6 m] of water had to be pumped into Lake Simcoe before the marsh could be navigated by the heavy equipment necessary for repairing damage to the marsh dykes, ditches, and canals. Plans to sacrifice one fifth of the marsh to save the rest was agreed upon. The first step was to bulldoze old cars, piles of hay, and other material into the culvert to block the flow of water from the west section of the marsh to the east section. The rest of the western section was blocked because the highway rose 15 feet. Steep Rock Mines in Atikokan shipped three 23,000-gallon pumps, the army detachment in Oakville sent 10 large capacity pumps, and Ontario Hydro installed a 30,000-gallon pump on the dyke that separates Lake Simcoe from the marsh.

The procedure for draining and restoring the marsh was nicknamed 'Operation Mop-up'. The operation involved approximately 2000 men over 15 days, plus private contractors working with heavy equipment. The water emitted a horrible stench from the floating rotting vegetables. One field of carrots was spotted floating in a two inch thick piece of soil that was able to float on the flooded water. Pumps had to contend with vegetables clogging their intakes.

In total 19 pumps using 25,000 horsepower, forced the set up of three emergency substations, ran continuously to drain Holland Marsh. The water level was reduced by one acre foot every minute and a half for a total average lowering of two inches per day [50.8 mm/day].

Approximately six to eight billion gallons [23 – 30 billion litres] of water were pumped from Holland Marsh's 5000 acre [20.25 km^2] eastern section in 24 days, 11 days ahead of schedule. The 2000 acre [8.1 km^2] section of the marsh lying east of the highway was also reclaimed from the floodwaters. Farmers rushed to prepare their fields for the next year in an attempt to salvage their 1955 crops.

A plan to raise the level of the dykes and deepen the drainage canals was supported by local Holland Marsh residents and the provincial government. Federal support for the project was sought as the cost of expansion was estimated at $250,000. Eighteen miles [29 km] of dykes would be raised and widened and the canals would be deepened to a total depth of ten feet.

Some marsh property owners were frustrated with plans to deepen the canals and widen the dykes because silt that was dredged from the canals was dumped on properties and used as fill for the dykes that were widened and built up. The cost of using silt from the canals to fill the dykes was less than removing silt and trucking in other fill, even though there was the added cost of compensating property owners. Silt is bad soil for crops.

The 1955 crop was especially rich due to the flood in 1954. Floods enrich the soil with a high mineral content due to the influx of mineral rich sediments brought with the floodwaters. The destruction from Hurricane Hazel also allowed farmers in the marsh to modernize and automate their operations, making them more profitable.

Humber River

The Humber Valley was described as a "wide deep trench (glacial)" that in several locations narrows to the width of the river with steep banks on either side from 25 to 50 feet [7.6 – 15.2 m] high. Comparatively, other locations are surrounded by wide floodplains that average several miles wide and 300 to 400 feet [91 – 122 m] deep. Although dams and reservoirs had been suggested for the river, there were no flood control works in place prior to Hazel. Part of the drainage basin was deforested and part was located in a highly urbanized area increasing the speed with which water could flow to the river. The river cannot handle a rapid increase in the volume of water. The Humber is a steep river, which exacerbated the flooding problem.

The Humber River caused the most damage and destruction in the Toronto area. The waters rose rapidly and with incredible force smashed into communities that lined the river's floodplains. Houses were swept off their foundations and numerous lives were lost. Many incredible rescue efforts were enacted even though the current was strong enough to jeopardize most boats launched into the waters. Several would-be rescuers launched missions to rescue stranded people, only to need to be rescued themselves. Despite the difficulties many lives were saved because of the quick action of police, fire personnel, and citizens.

A police radio message described the futility of launching boats into the river: "Twenty-three cruiser here at the Humber. The life saving people say not to launch a boat of any size… repeat of any size… in this river. Nothing can make it. Anyone in it will be killed for sure." (TS, October 15, 1964)

The difficulty in launching boats proved to be a source of frustration for bystanders attempting to rescue stricken people in the flood's path as described by Det-Sgt Jack Gillespie, referring to officers, "within hearing distance of these awful screams from women and children leaning out windows and hanging onto rooftops, but we couldn't get close to them until we got the boats and even when they came some of them were too small. If you didn't have a 15 horsepower motor, it was no good.

"Until we got the boats there was nothing we could do. You couldn't drive into torrents of water because your car would be rolled away. You had to watch the high power lines that were coming down, but mostly all you had to do was wait for boats." (TS, October 16, 1954)

After the storm, seventeen bodies remained missing in the Humber Valley. The search for the bodies began with 800 militia troops. The troops were equipped with boats, pike poles, flamethrowers, bulldozers, spades, and crowbars. The military operation name was 'Exercise Search.' The military contribution included 15 militia groups and 8 army reserve units.

Woodbridge

Woodbridge was the first community on the Humber to be hit with the floodwaters from Hazel. In this community, the river-normally 65 feet wide-extended to 350 feet [107 m] at its narrowest point during the flood. Sidewalks were uprooted and sewage and water mains broken. Nine people died and several hundred more were homeless. Twenty houses and every trailer in Glendale Mobile Home Park were ruined and another 50 houses in Pine Grove and Woodbridge were damaged. Casualties included Mr. and Mrs. Donald Reid and their daughter Dallas whose car was swept off Highway 7 after crossing a small bridge, Dianna Radley and her brother Robert drowned as they were being rescued with their mother, and John T. Clarke died when the west side of the highway crumpled and plunged into river.

Dianna Radley and her brother Bobby were swept away from their mother as the boat they were being rescued in was overturned. Myers, the boat operator, said,

> "I received the flood call at my house about midnight. Boats were being prepared to remove people along eight streets in the northern section of town.
>
> "There was a slight wind and it was real dark as I reached the evacuation centre. My 7½ horsepower outboard motor was put on one boat and I started my part of the rescue operations.
>
> "We had gathered in about six families when I was instructed with another, a local firemen, to go to the Radley house and take out Mrs. Dorothy Radley, an expectant mother, and her children.
>
> "There was Terry, 14, Sharon, 12, Dianna, 8, John, 7, and Bobby, 4.
>
> "I got the boat in close to the Radley veranda. The water was above the windows and the Radley family was sitting on furniture floating around the living room.
>
> "Mr. Radley and the fireman placed the children and Mrs. Radley in the boat. They stayed behind. The boat wouldn't hold any more persons.
>
> "I pointed the flashlight through the darkness and steered the boat out into the current.
>
> "We had hardly gone 40 feet when the boat crashed into an underwater object, it might have been a fence post.
>
> "The object ripped off the propeller and the engine stopped. Suddenly there was a rushing of water and the boat was picked up, twisted around in a circle and smashed against a big tree.
>
> "The boat overturned and we plunged into the water up to our waists. There was a terrific current. I managed to get all of the children and Mrs. Radley on the overturned boat.
>
> "I shouted for help and several firemen threw a life line. It fell short and drifted downstream. Then they formed together and started to wade out to us.
>
> "The boat shifted and Dianna and Bobby plunged screaming into the water. I couldn't find them in the darkness." (GM, October 18, 1954)
>
> "I was just too far away to be able to help her. A man on the shore was able to grab her by the shoulder, and just as he was pulling her clear of the water, a current swept both children out of her arms." (TS, October 16, 1954)
>
> "We managed to get Mrs. Radley and the other children into another rescue boat and to dry land. They have only found Dianna." (GM, October 18, 1954)

The Reids left their house in Woodbridge because they feared they would be in jeopardy because of the floodwaters. En route to Toronto their car was swept from the road through a washout 400 yards down the river. Sadly their house in Woodbridge was flooded in the basement and on the veranda, but not the first floor.

Della Perry and Walter Gamble were driving to Shelburne when they were washed into the river. John T. Clarke was returning home after dropping his date at home when his car was flooded off the road.

Carl Dyer (49) of Fergus, Woodbridge was stranded for three hours in the Humber River grasping a tree after his car was swept off a bridge on Highway 7 west of Woodbridge. Melville Robinson from Ebenezer rescued Dyer. Dyer described the rescue:

"I was going west and trying to creep across the bridge as the water had started running over the foundation. Suddenly there was a big wave and I felt myself going off the bridge. I barely remember climbing out the window, and as I broke surface I was carried some way, and crashed into a tree. I hung on to it for dear life."

"I hollered and no one came. Everything seemed to go hazy. I vaguely remember Robinson coming along, and pulling me out." (TS, October 16, 1954)

Robinson had stopped to check the bridge to ensure it was stable, "When I heard the hollering, I ran down the bank, and had to go up to my waist to reach the tree. The water had gone down some by that time, and I carried Dyer out." (TS, October 16, 1954)

Lieutenant John P. Connor commander of the Royal Canadian Sea Cadet Corps described his experience in Woodbridge:

> "Once in Woodbridge we were placed under command of the Fire Department and were assigned street detail. Our purpose was to walk alongside of the whalers and check houses for stranded inhabitants. The water was fast-moving and chest-deep and it took a dozen people to guide the craft through the current. One learned very quickly to keep a good grasp of the boat, as unseen culverts caused more than one temporary disappearance of the crew.
>
> "The most memorable event at this point was rescuing an 82-year-old bed-ridden grandmother – mattress and all, and her son who, two days before, had been discharged from hospital, having been confined for pneumonia. The son's activities were memorable as well. He stayed on his front porch all night, and with the aid of a broomstick, he personally rescued twenty-seven cats and fourteen dogs. All

were loaded aboard the whaler and the menagerie huddled together for warmth. Not so much as a hiss, scratch, growl, or bark occurred. When we reached high ground near the fire hall, our cargo of cats and dogs were last seen heading for still higher ground – but still together." (Kennedy, 1979; p. 79-80)

Mrs. May Lovett told this story of her sister's experience in Woodbridge during the flood:

"She was sitting in the living room and her husband was on the night shift in Malton. She looked up and saw water coming across the floor; she woke the children and put some clothes on them and then hurried out onto the veranda in the front. The street was already flooded, so they climbed on the railing.

"While they were there, some men came and got their boat which was fastened in the backyard. It was a large boat but when they came around to the street it was already loaded. They yelled at my sister to get in but she refused, as she knew it was overloaded. Just then it upset and all were drowned.

"She and the children stood on the veranda rail all night until firemen rescued them in the morning. She said it was a problem keeping the children awake as they were so young, but she managed by talking and telling them stories all night." (Kennedy, 1979; p. 81-82)

Thistletown

Two men, Murray and Clyde Deadder, were killed in this community when their car was caught in floodwaters and twelve families were homeless. Two bridges were undermined when their approaches were washed away and the 600 person village was isolated by the floodwaters. At the Hospital for Sick Kids, the pump house was disabled, but this could not be reported to the main Toronto hospital because of the isolation.

Weston

Weston is a community nestled along the east side of the Humber River, but the community had previously been located on the western flatland. Following several disastrous floods in the 1800's, town officials decided to move the community to prevent further loss of life and property, a move that undoubtedly saved lives during

Hazel. The former Weston town location is now the site of the Weston Golf and Country Club.

Jim Crawford was 23 and a police officer the night Hurricane Hazel hit Toronto, although he would become Staff Inspector at Toronto Metropolitan Police's 3rd District Headquarters. Crawford was off duty, that night, out driving in the rain when he noticed water flowing down Wilson Ave. He picked up his brother Pat and left to help.

> "Come on, get in the car, let's go. We can make heroes of ourselves tonight. (Joking) I can picture the Humber River being a real death trap," he said.
>
> "It's still quite vivid with me. It was quite some time after Hurricane Hazel–for many weeks, months, and even years after–I'd wake up in a cold sweat thinking about what could have happened. If I'm near fast-moving water, like a fast-moving current in a river–or a lake that becomes choppy–I think back to October of 1954."
>
> Crawford pulled up to Fairglen Crescent, near the Humber River off Weston Road, south of Wilson Ave., where he met Herb Jones, a contractor, who said that he had a boat, but no gas. Crawford located some gas for Jones and boarded his 25 horsepower boat and headed out into the river.
>
> "We went out into the river and to describe it, it was just unbelievable. The water was up now to the height of the telephone wires, there were people on roofs of houses, there was a lot of screaming and shouting."
>
> Jones steered the boat and Crawford helped people from porches and second floor windows. They collected people and delivered them to the shore. One couple refused to leave unless they brought their dog.
>
> "It's hard to describe the waves, we were just bouncing around like a cork… We were dodging debris, we were dodging houses… we were dodging telephone poles – luck was with us."
>
> Jones and Crawford saved 50 lives. They remained at it until daybreak.
>
> "By that time, I was soaked right through and had the shivers. I just couldn't stop shaking. I think probably a lot of that was not being cold and wet, but being scared too." (TS, May 27, 1984)

Mr. and Mrs. Joseph Ward of Weston were rescued from the roof of their house by a helicopter. It took several attempts for the helicopter to execute the rescue. The couple fled to the roof when their house was struck by another house that was set afloat by the flood.

Donald Curtis was rescued from the roof of a neighbour's house, but his mother was lost. Donald awoke when a dresser fell over and he felt the vibrations of the floodwaters beating against the side of the house. He woke his mother and they went to the veranda, but the house was already surrounded by floodwaters. Donald attempted to lift his mother onto the roof after he climbed up there himself, but could not. Then the house collapsed forcing him to jump to the neighbour's roof where he stayed until rescued.

Scarlett Road

On Scarlett Road, a dog barking in the backyard roused his owners who discovered the rising waters. The warning saved seventeen people, but 24 dogs were lost. The dog was confined in his backyard kennel and the waters were almost over his back.

"When I looked out and realized the situation, I dashed to the telephone and started calling my neighbours," related Mrs. Daisy Sparrow.

"I found him [the dog] almost drowned in the few minutes it took the waters to rise over his back. I unchained him and stumbled back in the water to the house. Then I got up the rest of my family and those next door. But the rest of the dogs in our kennels were lost, except for a few," said Herbert Sparrow. (TS, October 25, 1954)

Raymore Drive

Raymore drive was a quiet residential street located parallel to the Humber River across from the community of Weston. The Humber River rose and flooded the lower portion of the street, removing 1200 feet [366 m] of the street and 14 homes, and killing 35 people. Raymore curved in the southern portion with Gilhaven Avenue acting as a radius. The lower section was devastated, removing homes on both sides of the street. On the east side of the street, a few trees remained, but on the west side, the street was lined with rocks, boulders, and debris that was transported by the floodwaters.

The river floodwaters rose steadily Friday night and early Saturday morning and destroyed a Bailey bridge installed to span the river south of the Weston fairgrounds. The bridge then became a battering ram against homes on Raymore Drive, tearing them from their foundations.

John Neil returned from a bachelor party at the Army/Navy club to find the street flooded. Thinking that his family and neighbours had been evacuated, he proceeded to help evacuate residents of Gilhaven Avenue and did not realize until the next morning that his family was among the casualties.

The high loss of life has been blamed on complacency, a feeling that the Humber could not threaten residents. Older residents were quoted as saying that, "It's never gone this high before." In one situation, as a house was flooded to the ground floor the occupants moved the furniture to the neighbours house, which caused the demise of both households due to the extra time involved.

People were warned to leave the area. One man, George Bridger (17) recalled wading through water, sometimes up to his nose, to warn people to leave. Mrs. Thomas Waheling stated, "If he hadn't awakened me, I'd never have got out."

Herb Andeus of Gilhaven Avenue said he woke up and found water at his back fence. "I went out to get my dog from the garage. Water was up to my ankles. When I returned it was up to my knees. I sent my wife Lucy and boy Tommy up to the Army and Navy Club immediately." He commented that if everyone had heeded the warning the death toll would not have been so high.

Thomas Gould and his wife woke to hear a warning shouted. At that time the water was at their ankles, and then it rose to their knees, then to their waist as they left the house. "Our little house was 30 feet from the river. About midnight we noticed the water was up in the back a bit but we didn't think it was too much to worry about. But we decided–God only knows why–not to go to bed.

"Two hours later I was lying down. The first time we realized there was any danger was when a faraway voice shouted 'Are you floating yet?' I looked out the front window and all I could see was water. My husband was there trying to plug up holes in the foundation. He told me I had better get out fast.

"I phoned twice to my neighbours to rouse them. I grabbed my cat Smoky, my dog Prince–he's 16 years old–my bible and an old family picture. I stepped out the back door into water up to my knees. There was a terrible current. I scrambled around to the side and out the front and by that time the water was up to my waist," said Mrs. Thomas Gould to a Globe and Mail reporter. (GM, October 18, 1954)

Mr. And Mrs. Sidney Jamieson woke when the water was still on their lawns, but when they were dressed to leave their house, the water had risen up four of their steps.

Volunteer fireman Bryan Mitchell recalled what he felt the night of Hazel on Raymore Drive. "I felt so helpless, but there was nothing I could do, nothing anybody could do. The water was so deep, up to our chins, and all the firemen were weighed down by clothing and boats and equipment.

"It was like something out of a Cecil B. DeMille movie. The incredible roar of the water, like the roar of Niagara Falls. It was a gigantic flood with smashed houses and uprooted trees bobbing like corks, everything going down the river so fast. Houses crashing into the sides of other houses, people everywhere screaming. And then you couldn't even hear the screams anymore." (TS, October 14, 1984)

Mitchell described the efforts of the rescuers to Betty Kennedy in her book on Hurricane Hazel:

> "I think some of them realized their houses were moving, but a neighbour's house was on a solid foundation; therefore, they thought, 'Let's swim to the safety of the neighbour's.' That's what a lot of them did. Matter of fact as the water still rose they were right up on the rooftops of neighbours' houses, hanging onto TV aerials. Some stayed in their houses, and we could hear the screams when the houses were swept down the river with people in them.
>
> "All hell broke loose. People were screaming, 'Save us.....Save us.' We could get spotlights on them. We could see them…but they were just so far out you couldn't throw ropes. We tried floating ropes to them on logs, anything buoyant. We'd grab a piece of firewood, tie rope to it, and float it upstream, hoping the current would get it over to them and they tie it in some way to their house. We'd hang onto the rope on shore. Sometimes the only possibility was to swim out with a rope. We saw feats of strength we've tried to reproduce since, and we can't.
>
> "Norm Eldwin, who is now one of our district chiefs, single-handedly put up a 35-foot ladder and extended it out horizontally to span across to a house. We've tried that under ideal conditions at the back of the station and it's all we can do to lift it off the ground. It's a four – or six- man ladder. But these things happened. Everybody was working so hard. And you could hear people screaming… screaming.
>
> "The firefighters did a good job. But for every one we got out, there was another we couldn't get out." (Kennedy, 1979; p. 109-110)

David Philips, a resident of Raymore Drive, described the efforts to save people on the river, "As I stood there I could hear people screaming, I could see the houses tumbling into the river. I ran down to the river to try and help, but there was nothing we could do. We tried to get a boat out but the water was too rough. The firemen tried going out with ropes, hand over hand, but it was just too difficult, the river was too swollen. And the water just kept coming. We were forced to stand there and watch people die." (TS, October 14, 1984)

"The homes were literally lifted off their foundations and swept away. You could hear the people screaming. Many of them were standing on their roofs. In many cases the screaming just stopped; the homes just disintegrated, and that was the end of it," Philips said. (Kennedy, 1979; p. 108-109)

Diane Lockhart, a resident of Gilhaven and Raymore Drive and her family left the area for a safer area. "It seemed like it had rained all week and that it would never stop. That night I was in the kitchen with a friend of mine and my mother, who was sewing. There was a knock on the door and it was a neighbour who had come to tell my dad that the river was going up and might overflow. Mom made us all get dressed in warm clothes and we went up to my aunt's house farther up the hill."

Lockhart commented on why people refused to leave their homes, "I guess it's because their homes symbolized safety for them. It's like a horse going back into a burning stall." (TS, October 14, 1984)

When the flood was over and the damage assessed, it was decided that the area of Raymore Drive flooded so catastrophically that it would not be zoned for residential development any longer. Then the concern turned to the compensation survivors and displaced residents would receive for their properties. Jim Patterson stated, "I think it is time that someone put in a word for the neighbours who will never be able to speak for themselves…who lost their lives as well as their property on Raymore Drive in the flood. I think it is time to inform the Ontario government that those people did not live in any sort of Shack town. But that's what one might suspect from the $5000 limit that has been set in the restitution plan. I'm going to tell you that $5000 would hardly pay for the brick work on some of those houses."

Patterson's property on Raymore drive was not damaged. "However, I have an idea what some of my neighbours are up against. I can tell you that the $5000 limit is pathetic. Why some of the houses had mortgages for $9000 and $10,000 and the equity of the owners was considerable." (TS, November 1, 1954)

Mount Dennis

The community of Mount Dennis next to the Humber River experienced very high floodwaters with street lights running down the middle of the flooded river at one location. Cynthia Avenue properties had ten feet [3m] of water around homes and approximately 20 feet [6.1 m] of front lawns eroded by the river, leaving cliffs bordering properties. On Scarlett Road a woman and her family were trapped in a house that was surrounded by floodwaters 10 feet [3 m] deep; firefighters 100 feet [30.5 m] away could not reach the family to help. In South Mount Dennis where the Black Creek normally is one foot [0.3 m] deep and so narrow that a person is able to jump across, the creek swelled to cover Humber Boulevard, Porter Avenue, and Cordella Avenue.

Old Mill

George Eliot (33)-a telephone linemen father of three, and Queensway resident-survived for four hours in the flooded Humber River near Old Mill, by clinging to a tree before Max Hurley rescued him. Earlier attempts by the Toronto, York, and Etobicoke police failed. Hurley was able to navigate the river with his boat, to where he reached the stranded man; Eliot was rushed to St. Joseph's hospital.

Eliot was stranded in a car on a bridge when firemen threw him a hose to tie around his waist so he could crawl through the window of the car. The car was swept off Old Mill by the river and the line snapped before he could be pulled to shore. Spectators kept lights trained on the stranded man, where his face peered through the branches of the tree. When Eliot grabbed onto the tree, firemen attempted to reach him by stretching a ladder across the river. Lines were tossed to him, several projected by rockets. Boats were launched but the current was too swift. A helicopter was called for and the Navy launched a boat, but rescue attempts halted when Hurley managed to reach Eliot by boat.

"I don't see how I could have held on much longer. I thought I would drown for sure.

"Prayers, the will to live, the willow tree, and the lifesaver that gave me life and believe me I'm thankful to be alive.

"I threw up my hands and grabbed the branch of a tree. I was swamped with water and the pressure was terrific. No sooner had I pulled myself up into that tree when my car was swept off the bridge and nested up against it. I stood on the roof for a moment holding the limb all the time. It seemed like only a minute when the tree I was holding crashed down and I was in that crushing swirl of water again. I was drowning. I knew it. I felt in a minute I would be dead. Then by some miraculous stroke of luck my hand felt another branch in the water. I grabbed it, struggled and struggled until I could pull myself up again. I looked around and saw my car going down the river," Eliot related to reporters. (TS, October 16, 1954)

Firemen Stories

Five firefighters from the Kingsway-Lambton Fire Station were killed when they went to rescue people stranded in a car by floodwaters from the Humber River. The fire truck the men were driving became stuck on a flooded street and overturned tossing the men into the water. Five of the nine men on board died, Angus Small, Dave Palmateer, Frank Mercer, Tiny Clarence Collins, and Roy Oliver. Marsh Palmateer, Jack Philips, Jim Britton, and Bill Bell survived and related the sequence of events that killed their comrades.

The third call of the night sent them to Humber Boulevard, located parallel to the river between Dundas and Bloor streets. When they began down the street the pavement was dry, however it soon rose to above the wheels. Frank Mercer had missed the truck so he was following in his car. When the men in the truck decided to turn back, the car had stalled and the fire truck could not move it

Philips said, "We didn't realize there was any danger on the river road. The road was just a little bit damp near the falls, but there was quite a bit of water on the road a mile south of Dundas St. We didn't know if we could get through to Bloor St. so we decided to back down there.

"Frank Mercer followed us down in his own car, but when we tried to back up we couldn't get clear of his car. All of a sudden the water started to rise fast. The current became so strong that we were unable to turn the truck's wheels. We decided then and there we were just going to have to wait it out. We didn't think we had anything to worry about – the river was at its peak – but it was just starting, just starting." (TS, Saturday October 16, 1954)

The truck seemed more stable than the car carrying the extra man so the men on the truck decided to pull Mercer to the truck through the water. Palmateer said, "I threw the rope in and he (Mercer) grabbed it. I told him to jump out and we would pull him to safety, but he seemed afraid. The water was getting near the top of the car so I had to pull. Mercer came out of the auto all right but must have let go of the rope. He was washed away. We couldn't grab him." (TS, Saturday October 16, 1954)

"We kept the motor running as long as we could radio for help. In the darkness, we could just see and hear the chief and others on the bank trying to help us." "Finally the truck rolled over, I think the road washed out from under us because it was standing parallel with the current. The short time we were there, the river rose five feet. I was born right here and I have never seen the river like it."

"At one time we could have walked away from the truck, but we didn't think we were in any danger," Philips said. (TS, Saturday October 16, 1954)

"When the road washed out three of us hung on to the side of the truck when it rolled over" Palmateer said. (TS, Saturday October 16, 1954)

Years later, Jim Britton related his story to reporters:

> "There were supposed to be two people trapped on the roof of a car down the Humber Rd. Eight of us got on the truck and drove down there.
>
> "We couldn't find the car or any people in trouble so we started to turn around.
>
> "One of the firemen had missed the truck and drove down behind us in his own car. He got out and climbed on the truck.

> "Then this wall of water came from nowhere. We didn't see it: we couldn't even hear it. It picked the fireman's car up and smashed it into the truck. Then it drove into a tree.
>
> "The water started to climb the side of the truck. We radioed for help.
>
> "Police and firemen came down the bank but couldn't reach us with ropes.
>
> "We handed out whatever would float to the non-swimmers, then shook hands all around. God, they were brave. No Panic, no hysteria, nothing.
>
> "When the water hit the hose it took off like a snake. Without the hose the truck had no weight. We began to float, then we tipped.
>
> "I drove out as far as I could. My windbreaker had tight cuffs and filled with air, acting like a life-preserver. Somehow or other the truck's lights stayed on. I could see it tumbling over and over as it went down the river.
>
> "I couldn't swim, couldn't kick or do anything in that current. (TS, October 15, 1964)
>
> "I was on my back going downstream head first. All of a sudden, something hit me in the face. I grabbed for it and spun right around, and I found myself around a big tree. I didn't know how far I'd be from shore, but between me and the shore was like… well, I keep saying Niagara Falls. No way I'm going to let go… I'm on this beautiful big tree… I'm sitting up there and I'm hanging on. I'm above the water at this point. And all of a sudden I hear moaning. And here's this guy… he's hanging onto a little sapling. His head's just above water. (Frank Mercer, volunteer fireman was that man)
>
> "Frank, for God's sake, give me your foot. Get your foot up here and I'll grab it.
>
> "And he just got a funny look on his face and went down the tree like this and… ahh. He's gone.
>
> "A policeman threw me a rope and I don't remember hitting shore because they just gave one yank and I didn't go through the water… I went straight through the air. Boom." (TS, March 20, 1983)

During the cleanup after the flood the truck was discovered away from where it was lost and was very badly damaged.

Bryan Mitchell was a volunteer fireman during Hurricane Hazel. He eventually became the Chief of the Etobicoke fire services. Mitchell hung the axe from the lost fire truck on his office wall. Commenting on the lost firemen he said, "We'd all grown up around here and we knew the river. The boys got out and went to sit on top of the truck. They figured they'd just wait it out."

"It was so hard to believe that they were all gone. I'd been with them just a few hours earlier. This was like a small town back then. We all grew up together, ran fires together." (TS, October 14, 1984)

A relief fund was organized for the families of the lost firemen. Councillor Jerry Daub said, "These men were all ordinary wage earners and in one case a widow and three children have nothing at all. All of them having been risking their lives for years. We realize an overall fund has been set up, but we feel members of other volunteer fire brigades in the province will take a more personal interest in helping these families." (TS, Tuesday October 19, 1954)

The fund set up for the firemen's families gave wives $75 a month plus $25 a month per child. Mrs. Roy Oliver discussed her children's perception of the loss of their father with a Toronto Star reporter. "With the two smallest, they don't know what's happened. With Robert, he does know something is wrong because so many people have been coming to see Mommie who just isn't herself. He asks for his father. He tells people Daddy has gone back to the fire engine because he forgot his boots." (TS, October 20, 1954)

Long Branch

Etobicoke creek overflowed its banks, flooding three Long Branch streets completely, killing seven people. Island Road and 43rd Street, located in Long Branch south of the Lake Shore highway, flank Etobicoke Creek and were very badly damaged by the floodwaters. Most of the houses were condemned for fear of an epidemic. Four hundred people were evacuated from Pleasant Valley Trailer Park as the creek flooded. Pleasant Valley Trailer Park was located on the west bank of Etobicoke Creek north of the Lake Shore highway. The park held 140 trailers. Trailers forty feet [12.2 m] in length were picked up by the river and rammed into other buildings. Other trailers that were not entrained by the river had to be towed away from the contaminated area.

Several houses were washed into Lake Ontario, many while their occupants watched from higher ground or roofs, but some with the residents inside. Firemen and police rescued people from their homes moving them to higher ground or roofs. People pulled into the Lake were rescued with ropes thrown to them. Don Nuttley, a police constable working to rescue people the night of the flood relayed his experience. "I was in the water armpit high trying to guide a boat to rescue a group. The current caught me and I figured I was a cooked goose." Nuttley subsequently had to be rescued himself. Constable Nuttley was in the water for many hours before he was washed out to the Lake with a man and his family when Edgar Beaulieu threw a rope to them: "I was drowned. If Beaulieu hadn't pulled me out with a rope I wouldn't be here."

Another resident told this story. "I was trapped in my house and looking out the window I thought I saw a house slip by. There goes my father's house, I remarked, but then when my own house crashed down, I realized it was my own that had moved," said Jack Pickering a resident of Island Road. (TS, October 18, 1954) What had happened was that Pickering's house had been lifted from its foundation, transported 100 feet [30.5 m] where it was dropped onto his own car, which then became embedded in the mud.

Councillor Maurice Breen helped rescue families in a motor boat. "When I first went down people were standing in deep water. We thought they were all gone. I ran back to get some boards for a lifeline, then heard screaming. One woman fell down into the water; we just grabbed her in time."

Andrew Tannock of Island Road, Long Branch, was presumed dead when his house was swept from its foundation towards Lake Ontario. Tannock climbed into the rafters of the house and rode it to the lake. When the house touched down, he climbed out of the house and swam to shore.

Reeve Marie Curtis of Long Branch was quoted saying, "If it hadn't been for the trees, which held the houses back, half of them would have been swept out into the lake." (GM, October 18, 1954) For example, two trees prevented a house with 35 people perched on the roof from floating into the lake.

Norm Clift relayed his story of being stranded in the flood in a large dump truck to Betty Kennedy. "If I remember right there were ten or twelve of us–three in the cab and the balance in the box. We then started down the road and our first stop was at a cottage-style home whose older residents [The Thorpe's] refused to be evacuated on the grounds of having gone through floods before and going to ride this one out also. But as they had a young baby they asked us to see that it (I think it was a girl) could be cared for, and had a small valise with bottles full of formula packed. Two of the firemen waded through chest-high water to get the baby and the case, and brought them back to the truck." (Kennedy, 1979; p. 93)

Fire Chief Houston, who was also in the truck with Clift, describes the flood. "The water kept rising and to the point of stalling the motor, we finally cut the fan belt off. That worked for a short while and we managed to drive farther down the road where we rescued two people from marooned cars. Then the motor stalled and the current bumped us still farther down the road and we finally came to rest next to a big oak tree. There was also a house some twenty-five feet from us and car on its front lawn. Next door was a cement-block with an exceptionally high basement and a good solid roof. But as we were marooned on this truck with some five and half to six feet of water all around us we were literally at the mercy of the river. Finally somebody with a cedar-strip boat came by and took some four firemen and the two rescued persons from the car and the young Thorpe baby to the roof of the cement-block house." (Kennedy, 1979; p. 93)

"There we conversed in shouting voices, telling how much of the parked car was visible. It seems we first noticed the door handles disappear, then it was halfway up the windows, then to the roof, and I imagine it was around 3:00 or 4:00 a.m. there was only a spot of the roof showing. Then the spot began to get bigger and we knew the crest had been reached.

"During our stay in the truck and as the depth of the water got worse, we could see big mobile trailers from the trailer grounds north of the bridge on Lakeshore Road bouncing down the river and hear dishes, cups, pots, pans bouncing off shelves. We could also hear people screaming for help, but we were helpless to do a thing. At one point, there were flashes up the river as hydro lines snapped and fell into the water.

"The damage and sight of what the hurricane did was ghastly. Homes were knocked off their foundations, cars were flooded and filled with silt, roots and debris was all around. And the home of the people–all three or four–where we rescued the baby was completely gone–only the solid concrete steps remained," said Clift. (Kennedy, 1979; p. 94)

Ethel Forrester, of the Pleasant Valley Trailer Park described her rescue from the flood to Betty Kennedy.

> "We had retired for the night and were both asleep when we were awakened by a knock at the door. I opened it to find a man in oilskins with a flashlight, standing in a large puddle of water in the pouring rain. He said, 'Ma'am, there is a terrible storm and the creek is expected to flood. You should get out now while you have the chance.' I thanked him for the information, closed the door with thoughts that the best place to spend the night in a storm was inside my cosy warm trailer, then went to bed.
>
> "After about half an hour there was another knock on the door. This time the water was ankle deep and the man was more persistent in his demands that we get out and on to high ground. The rain and howling wind convinced me he was right. He told me to get a few things together and he would be back for us. We put on boots and a coat over our pyjamas and stood at the door watching the rising water. A man with a small pick-up truck came and asked if we needed help. He offered to take us to the Lakeshore Road. As we got into the front seat I could see the water was now up to his hub caps. He had a small dog that he gave to my son to hold and told us how he *just happened* to

> be driving by the trailer camp, saw the flood, and thought someone might need help.
>
> "He tried to drive to the Lakeshore Road but halfway there realized the water was too deep, so he turned back to try and get to the railroad tracks that were on high ground north of the trailer camp. By this time the water was so deep it was starting to come in the doors. We then knew we should get out before we were trapped inside the truck. With difficulty we opened the doors, and stepped into ice-cold water swirling up to our waist. He carried me; I carried his little dog; and son John half swam and half waded to the railroad embankment. Here on dry ground he left us, and took his little dog back into the swirling water to rescue someone else.
>
> "We climbed up the bank where many other people were standing in the bitter-cold wind, mostly in night clothes. One man offered me a drink of his bottle of spirits which I took. We then decided to walk to a road that was still high and dry. This would take us to Lakeshore Road. Here we managed to hitch a ride to a friend's house." (Kennedy, 1979; p. 58-60)

A suggestion was made that the flooded area in Long Branch be converted into a park because 700 residents were removed from the trailer park and the two condemned streets. Councillor Len Ford was quoted as saying, "We in Long Branch are hoping to have at least the southern part as a park; a part of the Metropolitan area's green belt. There have been too many floods to allow people to live here."

Residents were convinced to leave the area after the Hurricane Hazel flood. Mrs. David Kestenberg, a trailer park resident said, "I hate to be a quitter but that is almost too much."

Mrs. Ross Whitfield, another resident stated, "That's it! I'm leaving."

The local government requested that the provincial and federal governments purchase 192 properties on Island Road, 42nd Street, 43rd Street, and Lake Promenade west of 42nd Street. The area was condemned for health reasons. A sanitary sewer serving the area prior to the storm was seven feet below the riverbed, but after the storm, the sewer was located three feet above the riverbed. Of the 192 properties requesting expropriation, 43 were totally destroyed, 68 seriously damaged, 37 slightly damaged, 30 garages destroyed, and one store was seriously damaged. Preliminary damage estimates are greater than one million dollars. A plan was proposed to clear 300 homes from the lower elevations at a cost of $1,600,000 and create a 35-acre park.

Three quarters of the people who resided in the area have left. "We are not financially able to resurrect the services and look after the damage which has been done, but we have every confidence the people will be assisted to get out. There are only a couple of people who do not want to get out. Most of those who can get accommodations elsewhere have left, and we are trying very hard to find accommodation for the rest. We are placing people every day. People especially those with children don't want to be there, and they are cooperating wonderfully," said Reeve Marie Curtis of Long Branch. (TS, October 28, 1954)

When the Pleasant Valley Trailer Camp closed, Reeve Anthony Adamson answered criticisms saying it was, "only an extraordinary stroke of luck that some of you are not lying on a marble slab.

"We recognize the fact that Pleasant Valley is a pleasant valley except when it floods– and you have had three floods in five years." (GM, October 18, 1954)

Storm Orphan

Nancy Thorpe, a four month old baby was the only survivor of a family from Island Road in Long Branch and has been dubbed the storm orphan. The mother handed the baby to the Fire Chief, who carried her across the road. When he returned to assist the rest of the family from the house he discovered that the house had floated out to the Lake. The child's name was Nancy Thorpe and her parents were Mr. And Mrs. Clifford Thorpe. People were willing to open their homes to strangers based on media reports of the flood. After seeing a picture of the Thorpe orphan in the paper a family of eight offered to shelter another family of eight. Nancy Thorpe, the storm orphan was to spend Christmas with her Aunt and Uncle after which no more media reports regarding her whereabouts could be found.

Don River

Two cars were in the Don River after they were swept by floodwaters off the road. The three occupants were rescued. One stranded motorist was rescued by swinging an aerial ladder over the river with Captain Perry Stewart on the tip where he threw a rope to Alex Nicholson of Pottery Road. Nicholson was able to tie the rope around his waist, but he was dragged underwater part of the way towards shore. Edrich Moir found temporary refuge in an elm tree where he remained for eight and half hours until rescuers located a 20 ton road grader to drive into the river to reach the man. The force of the river moved the vehicle sideways. Jack Bates was rescued when a boat pulled him to safety.

> "I live close by the Pottery Road bridge over the Don and when the river started coming up I went down there to stop cars from trying to cross. On one side of the bridge the water I'd say was four feet over the road.
>
> "I got soaked standing in the water and went home to change and get a board to barricade the road when someone

said a car had gone in. I ran back and heard a man's cries for help.

"He was clinging to a small clump of trees in the middle of the water. When I tried to help him, the current caught me. I was going downstream when I got on the man's overturned car.

"I was on that car in the river for 2½ hours. Then I felt it starting to shift under me. It was as though someone was lifting it bodily.

"I decided to get off in a hurry. The water took me along and each time I passed some trees or bushes I tried to grab at them. I was able to hang on for awhile but the river carried me away from them.

"Then I got a grip on a tree and managed to hold on. I stayed there for three hours while the lifesaver got a line to the other man hanging on in midstream and pulled him out.

"They couldn't get the lifesavers' boat to me. Each time they tried the current swept it away.

"I waited there and watched the river. It was going wild. I'd say it was 300 feet across at one point.

"Then I heard the sound of a fence being broken and saw the end of a truck backing toward the river. It was a fire truck and next I saw a great ladder going up in the air and over the river.

"I said to myself, 'Here's help at last.' They lowered a rope to me and I wrapped it around my body. I'd tried to get my raincoat off but the cold water had stuck it to my body.

"I thought I was a goner twice. I was sinking into the river when the rope around me tugged me up again. Then I was out of the water and they were using the ladder as a derrick to swing me ashore.

"I was blue. They brought me to hospital and started rubbing me with alcohol. I shivered for an hour," said Nicholson after his rescue. (GM, October 18, 1954)

Jack Bates tells the story of how he became stranded in the flooded Don River. He was the man Nicholson tried to save before he became endangered himself.

"I stopped my car at the Pottery Road Bridge and hesitated when I saw the water. But I decided to give it a try and got almost across when the water took hold of my car and just lifted it into the river.

"I was there for about 20 minutes when I felt the car turning and got off before it rolled over with me underneath it. I grabbed some small trees and then a floating stump hit me in the back.

"I won't say now I wasn't scared. I really was. I was yelling for help all the time as I thought the people on shore would lose sight of me when I went under the water.

"I clung to my last tree for three hours. I tried to swim, but it was impossible in that current.

"Several times when I had water in my lungs and the trees were giving way I thought, 'This is it, I've had it.'" (GM, October 18, 1954)

Jim McArthur told the story of his experience on the Don during the Hazel flood to Betty Kennedy,

"The McArthur family lived in the Don Valley north of the Prince Edward Viaduct for over fifty years. My father and his father before him had kept an apiary of over one hundred colonies at the junction of Park Drive Reservation and the CNR main line. Now our homestead has been replaced by the interchange to Castle Frank on the Bayview Extension.

"This homestead was a wild and beautiful oasis in the middle of the city as we grew up. Our homes were located on an elevated plot of land which became an island each spring. We were accustomed to the annual spring flooding of the Don River and would just wait it out. That Friday in October was something else again.

"The high winds and heavy downpours were very unusual, as was the dead calm that followed. We experienced the usual flooding in the evening, with water running down the road in front of our homes, but paid little heed to it. As we patrolled around our island some time around 11:00 or 11:30 that evening, we became aware of a sudden rush of water, as though a dam had given way. Suddenly the water began to rise in the driveways between the houses. Then it poured into the window wells and under all the doors.

"There were four families living on that island. My neighbour, Jerry, and I rounded everyone up. We were able to make our way to the high ground (the hills of Rosedale) through the back of our property by wading waist deep water for about two hundred yards. It was terribly cold and we had no lights. We had phoned out to our friends. They met us at the top of the hill and gave us shelter for the night.

"My uncle Bill, who had lived in the valley all his life, refused to leave with us. He sat on the stairs to the second floor of his house and watched the water creep up, one step at a time. He tells of watching everything turn upside down. The lights began to pop and finally all went dark as the water shorted out the fuse box. The water eventually rose five and half feet on the first floor and ruined everything.

"Wondering if the houses would still remain, I returned very early the next morning. Chaos was everywhere. My father's bee hives had floated away and were piled up helter-skelter at the bottom of the field. The bees, of course, had drowned. Trees, lumber, doors, tires, and drums were stacked up in the trees surrounding the houses. Our cars were sitting where we had left them but were full of water. I really wasn't aware of the total effect that Hazel wrought on the whole city as I was too busy for the next two weeks cleaning up the mess. I did hear a story of one man who lived further up the Don at Pottery Road who spent a night up in a tree until rescued the following morning.

"Bridges were moved off their pilings and floated downstream until they came to the Prince Edward Viaduct. There they jammed and the result was one of the biggest piles of wood, trees, garbage, etc., one has ever seen. Months afterwards work crews were busy burning the debris–and looking for bodies. None were found, as far as I know. No one drowned in the Don Valley as some did on the Humber.

"The worst experience we suffered came after the storm. The vilest individuals who prey on the misfortunes of others came as scavenging around our homes hoping to pilfer items and run off with them. I drove a number away with the threat of the rifle, and I think I could have used it as I felt so depressed." (Kennedy, 1979; p. 53-55)

J.C. Fraser described the scene along the Don River after Hazel:

"The old iron Hogg's Hollow bridge on Yonge Street was washed out, and for months afterwards we had to negotiate a Bailey over the Don. It was sad but also comical to see the houses which had been built on the edge of the Don, where it takes a bend just before the bridge, projecting out over the river. The force of the water at the

> bend had washed away the bank and these houses lost their whole front lawn and the earth under them so that the house was sticking out from the bank about eight to ten feet. There are no houses there today.
>
> "The water carried this mud into the low-lying houses in Hogg's Hollow on the east side of Yonge Street. The water literally flowed in the back door and out the front door of many of them and I remember seeing the people shovelling away the mud which was about a foot deep and flowed like a river through the house and out the front door." (Kennedy, 1979; p. 123-124)

Greater Toronto Area

Damages

Golf courses suffered approximately $50,000 in damage from silt deposited from floodwaters in Lambton, Rosedale, Islington, and Scarborough.

A sign marquee advertising the movie *Gone with the Wind* was blown down by the wind from Hazel. (GM, October 18, 1954)

Mount Dennis Paramount Cleaners offered to clean clothes of victims of the flood from Weston, Long Branch, Thistletown, Woodbridge, and other areas for free as compensation for their struggle.

The Canadian National Exposition sent floodlights to the Bloor Bridge to assist in the search for bodies in the debris strewn river.

Radio ham operators established and maintained communication networks. Squads headed to Bradford, Woodbridge, Aurora, Weston, Scarborough and patrolled the Humber with Walkie Talkies aiding search for bodies.

On the Humber Flats 80 people were rescued from the Hazel flood and along the Highland Creek 17 cottages were washed into the creek as it flooded.

Experiences

Kenneth Cheetham described his experiences in Hurricane Hazel with Betty Kennedy saying of the initial warnings, that he had been, "dismissing them as just a means of increasing circulation in a slack period.

"After supper I took my four-year-old and two of his sisters for an adventurous excursion along Hollywood Avenue. We were stopped dead in our tracks about one block from home. A culvert under the street which normally transported a mere trickle of muddy water through a lush growth of weeds was now a whitecapped torrent roaring over the parapet a couple of feet above sea level and completely impassable.

"I'd always thought of a flood as something that rose gradually, like the tide, from which you could escape when it reached an unacceptable height, albeit with sacrifice of material possessions. But Hazel was not a tide, but a tidal wave, sweeping unprepared and unsuspecting people to their deaths in a matter of moments. Maybe most major disasters happen like this–they sneak up on you unexpectedly." (Kennedy, 1979; 61-62)

Dr. Mark Boyes was driving home when he learned that the rainstorm was a hurricane. "When I reached the corner of Bathurst Street and Lawrence Avenue the intersection was quite flooded and there was a lone lady standing at a bus stop – the water was well above her ankles. I stopped and offered her a ride, which she gladly accepted. She stated that she had just been to the hairdresser 'and look at me *now*!' I remarked that it was a very heavy rainstorm and she burst forth: 'This is no rainstorm; this is a hurricane!' I still could not believe that it could be so drastic, but she assured me that she had heard reports on the radio." (Kennedy, 1979; p.48)

Nancy Hubbert and her husband had an adventure the night of Hazel and relayed the story to Betty Kennedy:

> "On the night of Hazel, my husband (who doesn't believe in weather reports) suggested it might be nice to go up to Willowdale and visit friends. We duly hired a local youngster to baby-sit, whose mother had a comment or two to make about our sanity, and off we went. In the general vicinity of the Golden Mile, my husband decided the driver's door was rattling rather alarmingly and probably was not tightly closed, so he opened it to give it a good slam. Immediately it was wrenched off its hinges and took off into space. Frantically aware of the fact that this was a borrowed car, he was out in a flash, chasing the door until it came to rest, leaning against a truck in the parking lot. What to do! It obviously had to be removed to a safe place, so forgetting that he is a rather short, slight man, he picked it up by its sides to try to get it back to the car. Of course a tremendous gust came along at the worst possible moment and suddenly there was the father of my children sailing through the air, madly clutching the door as it carried him through space, and I was collapsed in helpless laughter unable to offer even a small measure of help.
>
> "When he finally came to rest, miraculously still on his feet, he found himself just outside the local drug store – Tamblyn's, I think – which was the only place still open in

> the plaza, and he made his way inside where he explained his predicament to the clerk and asked if he might leave the car door there until another day. As there was nothing in her rule book to cover such exigencies she decided it would probably be O.K., these being unusual circumstances, so between the two of them they managed to wrestle the door inside and lean it up against a display case. We then slowly and carefully inched our way home again, to our rented house, and our children, and our not too surprised baby-sitter, in our car with one door – and didn't venture out again for two days." (Kennedy, 1979; p. 49-50)

Mrs. Betty Dewar was riding home on the bus when Toronto began to flood from the rains of Hazel. "Going through one gully the water came up onto the floor. After we reached higher ground the driver simply opened the door and let the water run out. We found it very funny." (Kennedy, 1979; p. 50)

Many of the residents of Toronto that did not reside near the rivers did not immediately realize the severity of the storm and the ensuing flood. Ken Steele described his impressions of the night of the storm and the morning after,

> "I would say that it must have been around 10:30 or 11:00 that night that while walking home, alone, on Dovercourt Road, I noticed something strange in the air. It was the eeriest feeling that I have ever experienced and it has not happened to me since. It was extremely quiet, the weather mild. There was a great stillness in the air–nothing seemed to move around me. I remember looking up at the trees–not a leaf trembled. No automobiles, even, that I was aware of. (Of course, traffic was much lighter in those days.) I felt I was in a vacuum. Upon arriving home, I thought no more of it.
>
> "The next morning (Saturday) another surprise was in store for me. When I awakened and turned on the bedside radio, I honestly thought I was listening to an Orson Welles play–the announcer was talking very excitedly about houses being swept down the river with people clinging to the rooftops, pandemonium everywhere. It was only when he mentioned the Humber River that I came to my full senses and realized it was for real." (Kennedy, 1979; p. 61)

Southern Ontario

In an area that stretches from Kitchener in the west to Ottawa in the east and from Toronto to Sudbury, the Bell Telephone Company estimated its damages at $400,000.

Barrie

"The water came across the road. It should have gone under the road into the lake. But it came over the road and into our shop…..nd we opened the back door to let it out," said Eileen Scruton owner of a cabinet shop on Bradford Street in Barrie. (Examiner, Barrie, Sept 16, 2003) Barrie also had many flooded basements and damage to roads and sewers that would add up to approximately $10,000.

I.S. McClure of the Municipal Detachment of Ontario Provincial Police at Barrie related his experience in Hazel:

> "Our office had three lines and they rang continuously until about 9:00 p.m. when water must have gotten into them and they went dead. The calls were mostly from people whose houses were surrounded by water and who were requesting assistance. All I could do was advise them to remain inside until the water subsided. I had several calls from people who wanted to know if this was the end of the world–something which I was not in a position to answer.
>
> "After the phones went out of order, I was sent on patrol. The amount of water visible was beyond comprehension. At the intersection of Collier and Clapperton streets, the flowing water swept a woman and child off their feet and carried them down the Clapperton Street hill. They were rescued by employees of Deluxe Taxi and taken into their office.
>
> "The water in Kempenfeldt Bay (part of Lake Simcoe) had risen sufficiently to cover parts of Simcoe Street along the CNR railway tracks. At the foot of Mary Street, where it meets Simcoe Street, the water had undermined the railway tracks deep enough that a car would have been able to go under the tracks, which were four lines wide.
>
> "At the highest point at the top of Bayfield Street Hill, I had a flat tire on the cruiser and subsequently received another soaking. The depth of water at the top of the hill on the pavement was about four inches. This to me was an unbelievable sight, because it was the very highest point of land in the area. It caused me to wonder where all the water could be coming from.
>
> "A large storm sewer crosses Peel Street, but it was able to carry only a minute quantity of the water, so the extra ran above ground. It carried with it the front steps of a house on Peel Street, for almost a city block. When I refer to front steps, it was a solid block of cement, about six feet across and five feet high, with steps moulded into one side. The

> strangest thing about it was that it was left in an upright position with the railing still attached. Since the flood, now so many years ago, a large apartment building has been built on the very lowest part of the gully at Peel Street. When I pass it, I wonder what will become of it, should the Lord decide to send another flood." (Kennedy, 1979)

Beeton

Five people in two cars were killed when their automobiles were washed off a bridge. Jackson Glassford described the loss of Mr. And Mrs. Otto Haugh, Haugh's Uncle John and friend Robert Edgar in the Boyne River as the boat was swept off the bridge into the river. The occupants clung to the car for four hours but were drowned when they were being rescued. Another man, Ervin Joyce, attempted to warn the Haughs of the danger. Joyce was also swept into the river and drowned.

"Just as the last one was getting in the boat, a wave hit and turned it over. We lost all four in the darkness.

"We had just about rescued them. We had tried to reach them with a boat and 175 feet of cable, but it couldn't reach.

"We got another 25 feet and we all felt better when they grasped the boat. My son Allan was in the water up to his neck guiding the tow line. But then they were swept away." (GM, October 18, 1954)

Brampton

Streets were flooded (GM, October 16, 1954) and Frank J. Joyce was killed when the car he was driving left Highway 7 near Brampton and plunged into a 14 foot ditch. (GM, October 18, 1954)

Bridgeport

Sixty families were forced to evacuate to avoid floodwaters. (GM, October 18, 1954)

Coldwater

Coldwater, a community located 12 miles west of Orilllia, was evacuated after the town was flooded.

Cooksville

1500 chickens owned by Colin Price of Cooksville were swept away on flats bordering the creek.

Dufferin

In Dufferin, a newly constructed hospital was damaged in the flood costing $10,000 as the water rose seven feet in the basement ruining chemicals, bandages, blankets, and other equipment. The hospital proceeded to open, but patients would not be allowed into the facility until December 1st.

Grand Valley

South end residents were marooned as they were cut off from town by the Grand River which rose 10 inches in 20 minutes flooding the area. (GM, October 16, 1954)

Hamilton

Three people were rescued when their car stalled in a pool of water four feet deep. The heavy rainfall resulted in landslides on Mountain brow, which blocked off the Mountain block from James Street to Flock Street. Falling trees downed power lines and blocked the road linking the QEW. Underpasses at John Street and Victoria and Birch Avenues were flooded and James Street suffered cave-ins. Area basements were flooded. (GM, October 16, 1954)

James Bay

Hazel passed the James Bay area near Moosonee bringing strong winds and precipitating snow in the northern areas.

Kitchener

The Tent city at the International Plowing match east of Kitchener was damaged.

New Tecumseth

Seventeen bridges were damaged or destroyed at a cost of $10,000 each. (Examiner, Barrie, Sept 16, 2003)

Nobleton

In Nobleton, 15 families were forced to evacuate as a swollen section of the Humber River overflowed.

Oakville

Estimated damage in the Oakville area was $500,000 which included approximately 26 boats that were either sunk or damaged. (GM, October 18, 1954)

Oshawa

There was a black out in the town from Hazel. (GM, October 16, 1954)

Ottawa

In Ottawa at Lansdowne Park where the Argonauts were scheduled to play the Rough Riders, a fence was blown down by Hazel. Officials worried that many fans would pass through the hole in the fence without paying admission to the game as the break would not be repaired prior to game time.

George Auger, a 22 year old man from Hull Quebec, was electrocuted as he tried to move a tree that had fallen because of Hurricane Hazel, downing a power line.

Rouge River

The Rouge River east of Toronto also experienced flooding from Hazel. Ted Ryan described the flooding in the Rouge River Valley to Betty Kennedy,

> "Shortly after 10:00 that night the phone rang. It was my friend and neighbour, Fred Hunt. He asked me if he could borrow my auto-top boat which we used for duck hunting as he had gotten word at the corner store there were one or two families stranded in the lower Rouge River due to flooding.
>
> "Fred was at the house in a few minutes to pick up the boat and said he was headed to the foot of Island Road, which was the logical place to commence operations. I asked him to wait for me there until I got more appropriately dressed. When I was racing out the door, my wife, who was eight months pregnant, said, 'Don't you be going down the river in that boat.' There was no way I was going to miss out on this adventure as the Rouge area was quite rural at this time and this sort of thing was one of our

pleasures. Of course, I had in mind that we would serenely cruise down the river and, with some luck, possibly rescue a damsel in distress.

"When I arrived at the launching site, the scene was much different from what I had imagined. There were a few people gathered around one of the local fire trucks and the firemen (volunteers) were playing search lights down river, illuminating what appeared to be some cottages or houses in the distance. The wind was now a high-pitched scream. There was no river; the whole valley was a raging torrent trying to discharge itself into Lake Ontario, but was being partially dammed by the Rouge River railway trestle at its mouth.

My boat was sitting at the water's edge but Fred was not there. When I asked regarding his whereabouts, they said, 'Oh, he's gone down the river in another boat with one of the firemen.' This made me angry to think that he would go without me, as we had spent many hours in boats together.

"Gil Read, the owner of the corner store, arrived on the scene and I asked him if he would go with me. Gil was a little reluctant–maybe he figured he had had enough close calls in the tank corps during the war and shouldn't press his luck. In any event I talked him into it–and I may say here that I would not do it again, at least not in a twelve-foot canoe.

"Well, with the help of the firemen, we got the boat out into the water deep enough to mount the motor. Gil got in the front, myself in the back. Both of us are over six feet in height, weighing over two hundred pounds, so you can see we had a fair load to start with. After a few cranks the motor caught and we slowly moved out to the main stream.

"That was the last time we had any positive control over the boat. I knew we were in trouble, and it would be just a matter of time before we would upset.

"All sorts of things were tumbling downstream with us–pieces of houses, furniture, and I can remember one huge uprooted tree thrashing around just to the right of our path. We went past it at the right time, otherwise, we would have cracked like an eggshell.

"We were now running over people's front lawns, which were eight feet under us, and then we ran into a tree. (Although we didn't realize it at the moment, this tree saved our lives, and a few other lives, as we shall see.) I was able to hold onto a substantial branch of the tree which was at chest level. I don't know what caused it, but the boat started to sink beneath us, and then, in seconds, the current whipped it away into the darkness.

"My tree limb was strong and, needless to say, I was holding on for dear life. Gil was not so fortunate. All he could grab was a light branch that was already starting to give way. We were both stretched out horizontally in the silly current, and this is where long legs can come in handy. Gil made a desperate lunge and managed to get a hold of my ankles and crawl slowly over me and then up into a higher branch of the tree. There we both were, sitting in the tree like a couple of wet owls, not too proud of our seamanship.

"In the meantime, Fred Hunt and Howard Morgan, in a boat not much larger than ours, had evacuated two women and we could now see them coming down the river again to pick up two youths who were standing in the upper window about thirty feet from where we sat perched in their tree. We could not make ourselves heard above the howling wind and at that time no one knew what had happened to us.

"We watched them load up the lads and a dog, and then nose their boat out to head upstream. About halfway between the house and our tree, what looked like a dog kennel came tossing and turning, hitting the nose of their boat, causing the current to force them right against our tree. We exchanged greetings, told our story, and chitchatted back and forth with all of us trying to figure out a solution to get their boat, which was broadside, nose upstream without capsizing it. Fred had handed a flashlight to me, with which I was making simulated Morse code signals upstream to make someone up there aware that we had problems.

"Moments later I happened to shine the light into their boat. Water was pouring over the back, and within thirty seconds we had six bodies in the tree. The boat disappeared with the dog and I never did find out if he survived. To my knowledge the dog was the only casualty on the Rouge River during Hurricane Hazel. We were all shuttled to safety eventually with a more powerful boat driven by Murray Brown of Murdon Marine, Port Carling. Murray was a volunteer fireman in West Rouge at that time.

"I went to work the next morning, a Saturday, remorseful over the loss of my boat and motor. In the afternoon, I went down to the Rouge and was greatly

> surprised to see that the water had completely receded, leaving a devastation of caved-in houses and cottages with a layer of silt two to three inches thick over the whole valley.
>
> "I walked down the road toward our saviour tree, which was an odd-shaped cedar, and the last time I was down that way, it was still there. A little further on, there was my boat caught in a wire fence with the motor attached, and of course full of silt. Jammed under the seat was an Eveready lamp, still faintly glowing." (Kennedy, 1979; p. 73-77)

Schomberg

Early damage estimates for the community added up to $250,000. Damage reported included holes in sidewalks, undermined bridges, flooding along Main street, a planning mill ripped from its foundation, washouts on a parking lot that dropped cars into the newly formed hole.

Thornhill

A car plunged into the Don when a culvert on Highway 11 north of Highway 7 was washed away. The three occupants were rescued.

TRANSPORTATION PROBLEMS

Trains

A train hit a washout at Southampton plunging three cars into a ditch and miring others in mud. Stewart Nicholson, a Canadian National Railway (CNR) fireman died from burns and other injuries as the locomotive overturned. Gordon McCallum and Mrs. William Whittaker were injured in the crash. McCallum would later die from his injuries. Bertha Whittaker remembered the windows disintegrating during the crash. "I was sitting there with water running around me and blood running down my face. I sat there and prayed, for an indefinite time, until the firemen rescued me." (MacLean's, 1999)

Two trains were delayed because of washouts stranding 158 passengers. Ninety passengers were transferred to buses and transported to Agincourt, where they then could board another train to take them to Union station. Another commuter train left Toronto, stopped in Markham to pick up passengers and continued past Lindsay, where Frank J. Nobbs, a farmer, recalled: "We didn't hear a thing, not a sound. There was no crash or sound of a wreck. First thing we know, someone ran to our door shouted 'there's been a wreck'." (TS, October 16, 1954)

Engineer Ted Barrett reported that as the engine crossed a section of track that had the dirt, gravel, and sodding washed out from under it by a creek that had flooded to a torrent, "The engine started to settle and it dragged the two front cars with it. My fireman and I jumped as it turned and we were able to wade back to dry ground." (TS, October 16, 1954)

Trains carried many more passengers than normal after the storm. The CNR recorded 14,000 commuters, compared to the normal 1000 from the west to Toronto. The Toronto Transit Commission (TTC) reported thousands more on shuttle buses, but the Yonge Street subway trains were not affected. On Canadian Pacific Railways (CPR), conductors could not pass the clogged aisles to collect fares from passengers. A spokesperson made this statement, "In view of the situation, the collection of fares became secondary. Getting the people where they had to go was the important thing." (TS, October 18, 1954) After Hazel approximately 35,000 people arrived in Toronto from CPR and CNR commuter trains.

Roads

At the Cookstown Cloverleaf on Highway 400, 350 people were marooned at a service station. The road was washed out south of the location at Bradford and just north of the service station where a 20 foot gap had opened on the road. Highway 12 from Midland to Orillia was under three to four feet of water. There were major washouts on highways 400 and 11.

Traffic approaching Toronto from the west was halted as the Bloor Bridge over the Humber was threatened (see photo). The Humber Bloor Bridge was reduced to one lane and the Lake Shore Bridge was closed. Traffic was turned back at the Queen Elizabeth Way (QEW), Highway 5, and Lake Shore Road. Traffic was lined up to Cooksville attempting to cross the bridge. A bridge over the Don River on John Street, York Mills, between Bayview Avenue and Yonge Street was washed out

Forty bridges were destroyed or structurally damaged and ten were out of commission because of damage to the approaches including:

- Lake Shore Humber Bridge
- Highway 7 bridge west of Highway 50
- Lawrence Avenue Bridge, Weston
- Highway 2 Bridge at Port Credit
- Highway 400 at Willow Creek
- Highway 11 north of Thornhill
- 2 culverts north and south of Thornton, Highway 27
- 1 culvert east of Stayner on Highway 26

- 3 culverts on Highway 400 between Cookston and Barrie
- 7 bridges in North York
- 11 bridges in Markham
- 10 bridges in Scarborough
- Highway 49 at Kleinberg
- 3 bridges in Markham had their approaches washed out
- 6 bridges in Scarborough

Road damage caused long term economic disruption. Bailey bridges had to be erected to cope with the transportation problems. The Lake Shore Bridge was reopened to buses and pedestrians only after a bailey bridge was installed at the site. The bridge at Hogg's Hollow, damaged by Hazel, collapsed.

City planners feared that emergency plans to facilitate transporting people across Toronto's rivers and streams would encourage more people to abandon public transportation in favour of their own vehicles, a move that would increase traffic woes. This created problems for areas that form bottlenecks, such as the Bloor Street Bridge. Four roads remained closed while others had detours.

Damaged roads and bridges were repaired before winter, but the temporary fixes were not strong enough to resist the effects of the thaw. Temporary fill that was used to repair washouts subsided, in some locations dropping vehicles up to their axles in mud. A four lane bridge had to be reduced to one lane so construction crews could relocate the bridge by 18 feet [5.5 m] and add a 10 foot [3.1 m] span to secure one side of the bridge. This was necessary after a chain holding the bridge snapped. Highway 401's bridge over the Humber was reopened with modifications including shore foundations that were sited farther in from the banks and the addition of three central supports.

The proposed highway site (Gardiner Expressway) was changed following Hazel because officials decided that had a more southerly course been built prior to the flood, the bridge would have been destroyed, eventually to be washed out into Lake Ontario. There were major traffic jams at the one bridge remaining over the Humber River that was safe to cross. People were advised by police to, "Get as far north as you can before attempting to cross the Humber in either direction." (TS, October 18, 1954)

Boats

In Oakville, 25 boats were swept into Lake Ontario, including four cruisers and the Harbour Master's boat. The National Yacht Club estimated damage to their facilities and boats at $100,000. Jim Scott Jr., the owner of a boathouse at the base of Etobicoke Creek, estimated his loss from damage to his home, boathouse, and boats at $30,000.

The Harbour Master's boat lost from Oakville in the storm was hauled into Hamilton and became a ward of the court. The company that salvaged the vessel attempted to claim ownership, but the owners argued that since the vessel was lost because of Hurricane Hazel, an 'Act of God,' the vessel was not abandoned; therefore, salvage rights could not be recognized.

RECOVERY

When the waters receded, the enormous task of cleaning up and recovering from the disaster remained. Relief organizations very quickly organized shelters and clothing drives, and people in Toronto rushed to contribute what they could. Financial donations poured in from all over Toronto, Ontario, and from around the world. The Hurricane Relief Fund was organized to collect all the donations and see that the fund was distributed properly to people in need. Businesses donated their employee's time, money, and essential products. The militia was deployed for two weeks to assist in the clean-up and many remained after their deployment or returned on their time off to continue to assist recovery efforts. Throughout recovery, the severity of Hurricane Hazel forced government organizations to evaluate their handling of the disaster. The weather office was both praised and criticized for the warnings they issued. The lack of civil defence coordinators was also criticized. One of the most significant advances was the creation of Toronto and Region Conservation (TRCA) to cope with flood control, floodplain management, and water conservation issues around the Greater Toronto Area.

Aftermath

J.R. McFadden described the role he played in the clean-up after Hazel to Betty Kennedy,

> "A voice on the car radio was asking for volunteers to go to the Etobicoke Police Station. As soon as we stepped into the line for volunteers we were selected out of line and taken to the Coroner's office. My friend was wearing a medical jacket from the U. of T. and was asked if he was in Medical School and if he had done his work on cadavers yet. His positive response evoked a request from the Coroner and the Chief of Police, Andy Hamilton, that we set up a central morgue on the second floor of the old Fire Department, on the north side of Dundas Street just west of Burnhamthorpe Road.
>
> "The second floor was roughly divided down the middle by portable dividers. The entrance, which was at the back, was to be used for incoming and outgoing bodies, as

> well as those coming to try and identify their loved ones. As you entered the area, the Salvation Army people were doing an outstanding job of assisting the distraught people in search of their loved ones. Behind the partition, the now Dr. Elliot Baker and I were accepting the incoming bodies. Our job of setting up and administering the morgue turned out to be one of cleaning the bodies as best as we could and searching for some identification. We would then write a brief description of the body and where it was found, tag the toe, and give the description to the Salvation Army. Here behind the partition, we had three rows of bodies, men, women, and children in order of age. Each body was covered with a blanket.
>
> "It was obvious to us that many of these people had been swept away in the night as they were still in their pyjamas, and apparently had no chance at all of surviving.
>
> "Our most upsetting experience was setting one of our former public-school janitors, a volunteer fireman, brought in after having been killed trying to save the lives of others. We had known this man well and admired him for many years. We knew well his involvement with the volunteer fire department, as many times when the old firebell behind the school would ring we would see him run across the school yard to fulfill his obligation.
>
> "I remember one kind gentleman who came in to identify an old retired employee who had no family and had lived on Raymore Drive. The employer simply wanted to give his former friend a dignified burial.
>
> "I have often wondered how many of those ill-fated people might have survived if they had not gone back to gather some personal possession which some of them were still clutching." (Kennedy, 1979; p. 125-126)

Militia

Eight hundred troops journeyed to Toronto to assist in the clean-up and recovery operations. Fifteen militia groups and eight army reserve units formed the military contribution dubbed 'Exercise Search.' The men searched the rivers for bodies using boats, pike poles, flamethrowers, bulldozers, spades, and crowbars. Members of the area's navy units had also assisted in rescue operations during the flood, bringing both men and boats to aid operations.

The militia could not afford to keep men on the search effort indefinitely as militiamen were civilians and they could not be absent from work endlessly. Private companies could not continue to pay their salaries while they performed relief work.

Brig. Purves made this statement, "It is a matter of regret that in pulling out the militia we have no parallel group to hand over the job to. The civilian job of rehabilitating the Humber Valley will take from six months to a year. The flood was a major disaster in the history of Toronto." Militiamen spent their weekends searching debris piles and burning them where they remained in areas of stagnant water even after they went back to their regular jobs.

Relief Organizations

The offices of the Salvation Army were inundated with donations of clothes, footwear, blankets, food and cash. Relief work was offered from the Kiwanis Club, Lions, Knights of Columbus, and B'nai Brith. Marilyn Bell, the famed swimmer, donated personal shoes, clothes, and blankets at the Keele Street police station. The Springville labour camp in New York sent cooking equipment and beds. The navy sent 100 men and 12 whalers; the army 900 blankets, 350 mattresses, 175 double decker beds, and 150 stretchers. St John Ambulance sent 75 men and the Salvation Army 100 people. Boy Scouts watched for looting in Etobicoke. The Army Signal Corps set up communications along the Humber. Harold Bradley, Toronto's streets commissioner, placed bulldozers, trucks, and shovel loaders at the disposal of any community who needed them. Toronto provided water for Woodbridge and a brewery company used their own vehicles to transport water to Weston and Willowdale. The Red Cross sent rescue workers to Long Branch, shipped supplies to Bradford, and provided nurses to give typhoid shots in Woodbridge. British Boy Scouts donated 1000 pounds to area boy scouts who may have suffered loss. Members of the Junior Red Cross donated their pennies to help children flood victims.

Two men who were collecting donations for flood victims met a man who removed the jacket from his back and said, "Take this. They need it more than I do." (TS, October 19, 1954)

The Salvation Army storage facilities became full from donations forcing a request that no more donations be made, while assuring the public that if more donations were needed they would be asked for.

The Red Cross quickly assembled shelters in the effected areas of Ontario sheltering 90 people in Port Credit, 30 in Lambton, and 300 people in Bradford who fled the Holland Marsh. Shelter was the first objective for the Red Cross followed by food and clothing.

Two Red Cross women, Francis Bischoff and Pearl Butler, drove along Highway 400, which had been labelled impassable by officials, to deliver a truckload of clothing for flood victims, but they were forced to detour along Highway 11. When they arrived at Bradford they provided coffee and food, registered victims, and secured housing for the homeless. "We helped the parents and children to the community hall, where they were bedded for the night. The children were wonderful. There was scarcely a whimper out of any of them" said Bischoff. (GM, October 18, 1954)

Financial Donations

Toronto City Council donated $50,000, which was criticized as too little. Nathan Philips, a mayoral candidate, and Councillor Balfour requested $500,000 stating it was a "fitting contribution for a city like Toronto that has seen the worst disaster in the nearby municipalities." (TS, October 19, 1954)

Metropolitan Toronto proposed a $100,000 donation in addition to $50,000 donated by Toronto itself. Mayor Saunders had to consult the province to receive special legislation to allow the donation. Under the legislation, Toronto would pay 62% making the total contribution $112,000. Plus, Councillor Lipsett felt that the contribution of men and equipment would add up to $500,000. The Etobicoke city council requested $500,000 from the province to help people find homes.

The House of Commons voted to set the federal government's contribution to flood relief at $1,000,000. This was intended to match the amount the province had contributed. Frank Enfield, the Liberal representative from Scarborough, also urged the contribution of $5,300,000 to the Humber Valley Conservation Authority to build dams and prevent a recurrence of the Hazel flood, although a more comprehensive flood control program would be agreed upon later.

Hurricane Relief Fund

The Hurricane Relief Fund (HRF) was established to "receive contributions from all those citizens in this province and elsewhere who desire to assist those who have lost so much." (TS, October 18, 1954) Premier Frost and Metro Chairman Gardiner issued a national appeal for relief funds. Colonel Eric Philips was appointed the Chairman of the fund and the treasurer was Neil J. MacKinnon, general manager of the Canadian Imperial Bank of Commerce. The HRF goal was to assist the personal needs of flood victims. The monetary goal was $10,000,000.

Hamilton pledged $20,000 to the HRF. Other donations included $25,000 from the Ford Motor Company, $5000 from the United Church of Canada, $1000 from Laura Secord Candy Shops Ltd., $250,000 from the Atkinson Charitable Foundation, and $20,000 from the British American Oil Company. The Pope sent his "deepest sympathy" and $10,000.

Canadian businesses sent cash donations to the fund in addition to offers of goods, services, or labour. Businesses offering help included banks, insurance companies, and accounting firms. Operation and campaign expenses were kept to a minimum because volunteers completed most of the work. Plus, Pitney Bowes donated typewriters, Bell Canada donated the telephone services, and Grand and Toy donated desks. Autoworkers that were on strike, army, navy, and Boy Scouts also rushed to assist in the recovery.

Donations included Avro Canada employee's pledge to donate one day's salary, which would add up to $250,000. One employee of the company and his wife were killed and 115 others lost their homes or sustained damage. A Hamilton television station received $53,000 in pledges before Toronto television and radio stations had had the opportunity to organize events for the fund. Old age pensioners signed their checks over to the fund and some children sold toys to donate the money to the fund.

A large central office in addition to nine smaller branch offices was created to handle relief claims from Hazel. The offices handled claims for household contents and personal belongings either lost or ruined in the flood. This excluded items lost or damaged by seepage or surface drainage. Flood damages not covered by the HRF may have been covered by insurance or government grants.

Colonel Philips, Chairman of the fund made this statement, "We only calculate to restore a person to the minimum reasonable requirements for the necessities of life." This statement was issued to clarify that the fund was not the same as insurance. Complaints were made regarding the reduction of claim amounts awarded to applicants. Some argued that people were not receiving enough to replace what was lost. The Woodbridge Reeve declared that people were only receiving 25 % of what they needed.

Dependents of victims of the Hazel flood would continue to receive compensation after the dissolution of the HRF, from the Worker's Compensation Board.

The final break down of the fund was as follows:

- total emergency aid and relief distributed $5,132,024.40;
- 250,000 donors for a total fund of $5,278,624.98;
- a contingency reserve of $56,660.58 was set up for any future unsettled claims;
- 3425 persons benefited including 1197 children;
- orphaned children will receive, upon turning 21, $2500 plus accrued interest;
- 67 funerals and funds to 27 dependents amounted to $324,113.13;
- $1,392,633.96 was used to replace household contents and clothing in 1663 households for 5504 people;

- 859 farms experienced losses, 216 farms lost fences, 145 farms had bridges and culverts damaged for a total awarded to farmers of $1,810,354.07;
- 224 small businesses claimed for equipment and merchandise totalling $488,658.32;
- 222 trailer owners received $320,534.75;
- 19 Non-profit organizations, churches, hospitals, and summer camps for underprivileged children were awarded $111,271.07;
- 318 claims were from damages to automobiles and trucks amounting to $59,213.86; and
- total administration expenses were $59,734.64, 11% of the total collected for the fund (TS, August 18, 1955).

Insurance

Insurance companies set up special disaster service offices in New Toronto, Woodbridge and Newmarket to handle the volume of claims. Information gathered by adjusters at temporary offices was passed to the more than 200 insurance companies holding policies. The procedure was that claimants notified the company of damage, began repairs, listed losses and waited for adjusters to assess their claim. Many people found that their insurance did not cover damage sustained from floodwaters. "It's been impossible to get flood insurance on homes since the big Mississippi River flood of several years ago," said Douglas MacRae the joint manager of London and Lancashire Insurance Company Ltd.

Fire insurance would cover wind damage and damage from water that backed up from municipal sewer systems, but not floodwaters or the back-up of a private septic system. If a window was broken by the wind, it was possible to claim water damage and a policy holder could get partial reimbursement for damaged contents of the house if they had a personal property floater policy.

Evaluation of Organizational Response to Hazel

Fred Turnbull stated in the Hurricane Hazel Report by the Weather Office that, "I am sure many since the major disaster of last Friday have asked, 'Why did it happen?' There no doubt are many, too, like myself, who have, in attempting to answer that question, at least to ourselves, in private soul-searching, asked, 'What could I have done which might have prevented the tragedy?'

"From the meteorological standpoint, it seems to me that every possible step was taken and taken in adequate time. It may be argued that we did not sufficiently stress the amount of rain, but even if we had been able to forecast Malton's 5.3 inches of rain in terms of definite figures expressed in inches, I wonder how many, if any, would have interpreted a five-inch rainfall as a disastrous amount. Certainly, I was fully aware that rainfall totals were likely to exceed the all-time record of four inches, but I definitely did not have sufficient knowledge of the Humber watershed or sufficient imagination to interpret that amount of rain in terms of the tragic flood conditions." (Kennedy, 1979; p. 42-43)

Transport Minister Marler commended weather forecasters for averting a worse disaster through their accurate and timely warnings. "While loss of life and property have been great, there is no doubt that the catastrophe would have been much more extensive had it not been for the accurate timely and very emphatic warnings…by the Malton forecast office of the department's meteorological service."

John Knox a forecaster with the Meteorological Service at the time of Hurricane Hazel presented at a Symposium in 1992 a report on Hurricane Hazel. "How well were the public warned? More than 24 hours prior to the event, on Thursday evening, well before Hazel had reached the South Carolina coast, the Ontario Weather Centre predicted, that because of the northward progress of Hazel, substantial rain, additional to what had already fallen, would reach Toronto late the following day. This forecast was reinforced on the night shift on the basis of what turned out to be an extraordinarily accurate prognostic chart by Norman Grundy. He predicted that Hazel's centre would be accelerate northward and reach western Lake Ontario that evening, and issued a forecast indicating strong winds and heavy precipitation by that time. I relieved Norman at 8 a.m. and he had no trouble convincing our boss Fred Turnbull, and myself that we had a very dangerous storm on our hands. In fact the atmosphere of the Office was really charged, and it's curious how one remembers the details of circumstances such as these, decades after the event. After analyzing the 1230z chart it was clear that a warning should be issued. It went out at 10 a.m. and we really laid it on the line, winds increasing to 40 miles per hour gusting to 70 miles per hour, and moderate to heavy rain beginning over Metro Toronto that afternoon and continuing into the evening. This warning was promptly disseminated by the newspapers and the radio and T.V. stations. Fred Turnbull, after consultation with yourself, Pat, as to how best to proceed, personally phoned every agency who might conceivably be concerned. These included Fred Gardiner, who was Metro Toronto Chairman at the time, Ontario Hydro, other provincial government agencies who might be involved in river monitoring and control, Lake Shipping interests and, to make sure they had received the warning, the press, radio and T.V. stations.

In spite of all this, there still remain people, who, during anniversaries marking the tragedy, poor-mouth the weather forecasts, and allege there was insufficient warning. For example, Betty Kennedy in her interesting, and otherwise well researched account of the tragedy, tells the reader that the warning was "low-key", and regarded by some as "the best kept secret in town". Nothing could be further from the truth." (Knox, 1992)

Agriculture Minister Thomas said, "Surely these rains and floods will teach us the urgency of more flood control measures being taken and the need for erection of small dams in all 'flood danger' areas." (GM, October 18, 1954)

Major-General Frank F. Worthington, Canada's Civil Defence Coordinator, felt people died who could have lived and property was lost that could have been saved. "Everyone did his best, but I can't help reflecting: What a shameful waste of life and property. It needn't have happened.

"If there had been any kind of civil defence organization trained and equipped, it could easily have been mobilized and it would have filled the breech." (GM, October 18, 1954)

Worthington praised in his assessment of the response to Hurricane Hazel: the courage and ingenuity of individuals and organizations; the speed and efficiency of the Red Cross, Salvation Army and other response organizations; and the tireless enthusiasm of civic officials and employees for aid. Worthington criticized the lack of adequate warning and enforcement of warnings; the lack of advance preparation; and the general disorganization of motor traffic which lasted days after the flood. Worthington's recommendations included the immediate formation of civil defence units supplemented with training and equipment and the recruitment and training of extra policemen by municipalities. "We've been doing a lot of talking about civil defence and we've heard a lot of talking. What happened during the floods talks for itself." (GM, October 18, 1954)

Cost

A Royal Commission was formed by the Federal Government to assess the cost of Hazel and included John B. Carswell, the former Chairman of the Fraser River Dyking Board, and D. Bruce Shaw, of a Toronto bonding company. The two-person committee found that the cost was less than $100,000,000, with between $10,000,000 and $12,000,000 reflecting damage to personal belongings and household effects. The total damage estimate includes soil erosion and other related effects of a flood of this magnitude.

The actual cost from Hazel is difficult to estimate, as it depends on the costs that are included and the people that are conducting the assessment. The lowest estimate of cost for damage to personal belongings, household effects, and structural damage listed in the Royal Commission Report was $25,000,000, which increased to nearly $100,000,000 when considering longer term impacts. The Royal Commission was convened just weeks after the disaster limiting the number of costs that could be included in their estimate and affecting the accuracy of the assessment by failing to provide for longer term effects.

The Department of Public Safety and Emergency Preparedness Canada compiled disaster statistics for all of Canada and estimated the modern day cost of Hurricane Hazel at $1,031,643,000. The present assessment of Hurricane Hazel considers longer term economic disruption, the cost of lost property, relocation, and recovery costs and portrays a more accurate estimate of the actual impact of the storm in Southern Ontario.

MITIGATION

Hurricane Hazel was a disaster, but a benefit that came out of the experience was the creation of Toronto and Region Conservation (TRCA) and flood warning systems. The TRCA was created out of several smaller conservation authorities to manage the region's floodplains and rivers. Dams had been proposed for the Humber River prior to Hazel to act as water regulation dams. After Hazel dams were once again suggested to help prevent another flood of Hazel's magnitude. The creation of dams capable of holding the amount of floodwater that Hazel created are very expensive and only a few of those proposed were actually constructed. More importantly from a flood control and conservation view was the acquisition of floodplain land and the alteration of zoning laws to prevent redevelopment of flood risk areas along the rivers.

Dams

Toronto city council blocked a plan two years before Hazel to build three dams on the western branch of the Humber River. The Humber Valley Conservation Authority planned to revive the plan as they investigated ways of preventing future floods. The authority approved the idea when it was proposed, but council rejected it because Toronto would have had to subsidize most of the $2,000,000 cost. The smallest dam would have been sited south of Stanley Mills south of Highway 7, another at Clairville half a mile south of highway 7 and at Ebenezer just north of the road linking Brampton and Highway 11. The chairman of the authority, Leavens, said that the dams would not have stopped the flooding, yet they would have had, "a wonderful effect." The western branch of the Humber drains a third of the Humber, so dams would have held back some of the water.

S.L. Barnes, the Assistant Director of conservation for the province, was inclined to agree with Leavens, however, dams strong enough to hold back the floodwaters would have been very expensive.

Eric W. Baker, a representative of York township was opposed to the dams because he felt that the dams would have had little impact on the large volume of water that Hazel produced. Plus, he felt that the flood peak was magnified by urban development in the area. He favoured a plan that would have the weather bureau report frequently the rainfall during a storm and then municipal officials would be tasked with predicting the flood peaks and warning people of any ensuing danger. Baker also recommended that floodplains not be built upon.

A.H. Richardson, Ontario's chief conservation engineer, indicated that had all six proposed dams been constructed, the flood peak would only have been reduced by 35%. "Floods are not the river's fault," Richardson said. (TS, October 19, 1954) Floodplains belong to rivers. Plans to construct dams, complete contour plowing, reforestation, and farm ponds assist in the retention of flood waters, whereas, straightening channels and removing obstructions in the river channel speed the current. When people chose to build on a floodplain they are doing so at their peril.

The Metro Planning Board asked the provincial government to move all residents out of river flats. Metro Chairman Gardiner felt that dams were unnecessary except to maintain the summer water flow and preserve the environment.

"When we are honest with ourselves, and get down to the bottom of the flood problem, about 90% of the permanent flood damage is the result of building roads, railways, factories, homes, farms, and what not on land that properly belonged to the river," according to a US Army Engineer. (TS, October 19, 1954)

It has been recognized that people continually return to flood prone areas. If ten to twenty years pass without a repeat of a flood, people may consider the location safe.

Land Expropriation

Controversy surrounded many of the efforts to expropriate land after Hazel. Jim Patterson said, "I think it is time that someone put in a word for the neighbours who will never be able to speak for themselves–who lost their lives as well as their property on Raymore Drive in the flood.

"I think it is time to inform the Ontario government that those people did not live in any sort of shacktown. But that's what one might suspect from the $5000 limit that has been set in the restitution plan. I'm going to tell you that $5000 would hardly pay for the brick work on some of those houses."

The government planned to expropriate low-lying land where a recurring flood hazard existed. Property owners were to be paid fair market value in addition to compensation for damage to homes and other buildings. Properties were eligible for eighty percent of their assessed damage up to a maximum of $5000, with a $100 deductible. Private insurance payments also factored into the compensation received.

Homes and property loss compensation were kept separate from damages claimed for personal and household belongings that were the responsibility of the Hurricane Relief Fund.

The Ontario Mobile Home Association demanded to be treated the same as any other homeowner in terms of compensation. According to the reparation package presented to them from the Port Credit Council, mobile home owners were only eligible for $300, whereas damage sustained to their property was closer to $2000 or $2500. Of 143 trailers in the park, most were completely covered by water, 50 remained, and 20 were inhabitable due to water damage.

Trailer owners continued to fight with council, while they tried to locate temporary housing. The treasurer of the association stated that he did not think the mobile home owners should expect Council to compensate them because the Council had wanted them removed from the area prior to the storm.

Thirty properties in Long Branch were expropriated for $139,050. The properties were located on Island Road, 43rd Street, 42nd Street, and Lake Place. $61,900 was received for seven properties in Etobicoke's flood area; two houses on Raymore Drive received $11,200 and $8,300 and the others were on Gilhaven.

Property owners in Long Branch were unhappy with the $800,000 for expropriating their 164 properties. "Not a deal but a steal," ratepayers charged at a meeting. William Bywater of Island Road said this, "I was robbed. I signed. But I don't want you people to take it. I went down to the municipal offices. They offered me $3400 for my home. I took it. I owed $2800 on it. So I cleared $600. But I am unemployed and I had to pay $19 rent for two rooms after the flood."

John Plewes said, "I wasn't damaged and I don't want a nickel. Give the money to those that were hurt. But I'm a working man. I'm in no position to go out and buy myself a $10,000 house. Why move me? Let those who want a park pay for it."

The group of angry residents set up an informal standoff with Metro Council. Area Reeve Marie Curtis claimed that some members of the group had intentionally instigated the group in order to receive more money than the fair offer extended to them.

Two families in Long Branch were removed from their properties after refusing a judge's order that they leave by July 15, 1955. The property owners were holding out for a higher compensation settlement. The issue went to arbitration, but a decision was not expected until September. One of the residents, Thomas Sprigy, was offered $6100 for his property, but he claimed it was worth $9800 because he bought it seven years previously for $4900 and made improvements. Similarly, Thomas Tugwell, paid $5100, made improvements and then was offered as compensation $4200.

Twenty-four homeowners in West Hill were upset with the Scarborough Council because they would not expropriate their homes. Highland Creek runs through the community and during Hazel the creek overflowed its banks, destroying 13 cottages, and eroding chunks of earth, burying cars and picket fences. It was recommended that the land be expropriated, but the issue is that the homeowners do not own the land their properties reside on.

Properties in the Humber trail area were expropriated for \$143,000 and the site was set to become a conservation area. The plan involved 43 residents and 30 vacant lots in a 50-acre section of the trail located at the forks of the Humber River.

Flood Control Plan

A section of the Don Valley in North York would pose a flood threat if another Hazel-like event occurred. The section is north of Sheppard Avenue and east of Bathurst Street. Four culverts were built under Bathurst Street to replace a bridge that had aggravated the flood situation.

A section of Black Creek that runs under the Lambton golf course was rerouted. A sewer system that connected Weston and York townships to the main sewer was dug through the golf course, which is connected to the sewage treatment facility. The Black Creek will run above the sewer and drain into the Humber River.

TRCA proposed that a regional plan to prevent floods was needed, but the cost of such a program would be too much for individual property owners to bear, therefore, federal assistance would be required. In 1959, TRCA developed a flood control proposal that would require the involvement of all three levels of government titled *Plan for Flood Control and Water Conservation*. The proposal included 13 dams and reservoirs built over 10 years for a cost of \$34,607,601. The plan required acquisition of 7600 acres (31 km^2) of floodplain, which would eventually become parkland and recreation areas and 10 lakes. New flood control basins would be used for summer regulation of flow for pollution abatement, erosion protection, extra water supplies, and fish and wildlife preservation areas. The economic benefits would be \$56,625,000, with the federal and provincial governments each contributing 37.5% and the municipalities contributing 25%.

Under the plan the Humber River would develop six reservoirs, have channel improvements at three locations, plus require the acquisition of 1000 acres (4 km^2). Etobicoke Creek would develop one dam and reservoir and acquire 1200 acres (4.9 km^2) of floodplain land. The Don River would form two dams and reservoirs, have channel improvements, and result in the acquisition of 2000 acres (8.1 km^2). The Rouge River would see the repair of one dam and the acquisition of 1300 acres (5.3 km^2). Dufferin Creek would receive two reservoirs and acquire 1000 acres (4 km^2).

One reservoir would be built on Highland Creek and 800 acres (3.2 km^2) would be acquired. 300 acres would be acquired around Mimico Creek.

Under the TRCA plan Black Creek would also receive a dam and reservoir, channel improvements, and the acquisition of 250 acres (1 km^2). The cost would be $4,740,000. The cost for the other phases of the projects are as follows: Humber River – $16,179,600; Etobicoke Creek - $2,522,000; Don River $10,555,000; Rouge River - $1,325,000; Dufferin Creek - $1,979,000; Highland Creek - $1,477,000; and Mimico Creek - $600,000.

The area watersheds had suffered 41 severe floods dating back to 1804. The two worst were Hazel and another in 1878. The Humber had suffered 14 severe floods, Etobicoke Creek, seven, and the Don River, six.

Opponents of the flood control proposal argued that property owners that would benefit from the plan should bear more of the cost than the entire taxpaying public. Others stated that if development was banned in the floodplains and existing development were removed, the expensive plan would be redundant. The mayor, Nathan Philips, was opposed to the plan. Philips felt that a detailed engineers report should have been received prior to initiation and that the acquisition costs should have been limited to $12,000,000. In 1960, the Land Acquisition Program was begun with $22.5 million allocated for flood control structures throughout the 11 year process to develop and implement a comprehensive floodplain planning policy.

The flood control mitigation used by the region involved structural changes, acquisition of vulnerable property, development control, and an extensive flood warning system. Craig Mather, the water administrator for the TRCA stated, "Right after the hurricane there was a lot of money made available to us to buy property and build dams. But as the years went by these projects became less critical and funding became harder to get. There's less emphasis now on the structural approach because we just can't get that kind of money. We certainly won't have a major devastation on our hands. We're in much better shape today." (TS, October 14, 1984)

326 square miles (844 km^2) of parkland were created around the area river valleys and lakes by 1972. Approximately two million people per year visited the parks. Nineteen years after Hazel, one major dam on the Humber had been completed, another on the Don River was near completion, plus two smaller dams on the Rouge River had been finished. Eleven more dams were proposed for the Humber River, and Etobicoke and Dufferin Creeks.

In 2003, three dams from the initial proposal have been constructed including the Clairville Dam (1964), and the Milne and G. Ross Lord Dams (1973). Additionally dams at Stouffville and on the Black Creek at Sheppard Avenue were built, which were not in the original proposal. Twelve major flood control channels were built and two flood dykes. Erosion control projects were instituted and 32,000 acres of land were acquired.

Ontario's flood warning system is managed by the Ministry of Natural Resources, Conservation Authorities, and Environment Canada. Committees containing representatives from all three groups meet to discuss flood control. Watershed conditions are monitored including snowfall conditions, precipitation and flows, and if necessary, flood warnings are issued. There are three levels of flood warnings that may be issued: 1) flood safety bulletin/advisory; 2) flood advisory/alert; and 3) flood warning.

Parks and Zoning Laws

A man requested permission from the Humber Valley Conservation Authority to build on a property that was under 15 feet of water during the Hazel flood. The property is located next to a property where three people died. The man argued that if he is not permitted to build on his property then no building should take place in three US states that have experienced flood damage. The man purchased his property in 1952 and he did not feel there was much chance another flood of Hazel's magnitude would occur again. Permission of the regional planning board was required. The new residents of the home where people died and other neighbours supported the man's right to build because they argued that a recurrence of the flood was not possible in the next 100 years.

Long Branch properties were expropriated to prevent a recurrence of the flood and turned into a 35-acre park after the area was elevated by 10 metres through infilling. Etobicoke considered a ban on building along rivers on land below the peak flood level established by Hurricane Hazel. This land would be used for farming, reforestation, or parks.

Along the Humber River from Lake Ontario to Dundas Street is parkland. $95,000 was raised to purchase land, $50,000 for the first stage of development. On the east side of the river the marsh was cleared of junk that has been dumped there over the years and maintained for birds and wildlife. North of Bloor near Old Mill, retaining walls were repaired and rebuilt. Highland Creek development involved a large project where 1000 acres was to be converted to picnic areas and nature trails. $200,000 has been set aside to acquire property.

Marie Curtis Park in Long Branch encompasses land on both sides of the Etobicoke Creek along Lake Ontario. The plans for Marie Curtis Park were developed before Hazel, but it was not until the disastrous Hazel floods that anyone was interested. During Hazel 43 homes were destroyed in the area and 360 people were left homeless (see photos). Twenty acres of property was acquired. Property owners were paid a total of $800,000 for the 164 lots that fell with in the new park's boundaries, which Long Branch and Metro paid 25% each of and the province paid 50%. Then Long Branch donated 6.5 acres and the federal government another 8.5 acres. A landfill program added another ten acres.

A dispute arose in the Metro Planning Committee's plan to rezone the Eglinton Flats as a greenbelt. The property owners threatened to build on their land without support and approval by the planning committee because they feared the property would not be worth as much if the rezoning went through. The Eglinton Flats area was converted into a nature recreation area, with ice-skating rinks, a tobogganing hill, tennis courts, and community gardens.

A new development on the Eglinton Flats was barred. There is 135 acres property owners want zoned as commercial or industrial. People protested the ban on building on the Eglinton Flats claiming they were prevented from developing property that was not flooded during Hazel, while other areas that were flooded were developed.

Land developers attempted to circumvent the TRCA by applying for permission from the Ontario Municipal Board to develop property west of Weston Road next to the Humber River. Permission was sought to build a high rise apartment building, but was rejected by the board.

Property owners whose land was designated as floodplain saw their property values drop from between $10,000 and $30,000 an acre to $2000 an acre, plus they could not build on the land. The area where houses were wiped out by floodwaters on Raymore drive was acquired as parkland and a playground was installed.

A 50-acre lake was created behind the 65-foot dam northeast of Dufferin Street and Finch Avenue. The park was named the G. Ross Lord Park after Toronto's flood control engineer. The flood control dam was expected to cost $5,000,000.

A developer offered the TRCA 14 acres of land for parkland if they would be allowed to build two high rise towers on the remaining 13 acres they owned. The authority refused because the planned development would be on the banks of the Humber River and would be below the high water level established by the Hazel flood. The developer accused the authority of 'sterilization of the company's property.' The TRCA has successfully blocked any new development on Toronto's floodplains, however, they have not been able to prevent redevelopment. The TRCA has acquired more than 14,000 acres of floodplain.

The definition of flood prone land has been modified with two different levels. The first is the regional high water watermark set by Hurricane Hazel and the second is the 100-year flood level. Some communities, like Uxbridge, lie entirely within the 100 year level, therefore limited development must be allowed with building modifications, such as reinforced walls and breakwalls.

A proposed development in the St. Lawrence Square area fell entirely within the Don River floodplain. The project at King and Parliament would create 700 residential units in an already built up area, but the development would require special flood protections be included in the development. The Don River has a low western bank, therefore, water could reach Yonge Street in the event of a flood. The entire area has special guidelines for new development.

An editorial included a tirade against the requirement that all development in the Don River flood zone east of Yonge Street meet specific design criteria. The author questions whether this is pushing the safety issue too far as a Hazel event is only likely every 1000 years.

Toronto and Region Conservation

In 1946, the Province of Ontario enacted the Conservation Authorities Act, permitting municipalities in a watershed (or watersheds) to form a Conservation Authority to conserve and manage natural resources. In 1957, the Metropolitan Toronto and Region Conservation Authority (now known as Toronto and Region Conservation) was formed, replacing four smaller authorities.

Since its formation, Toronto and Region Conservation has prepared and delivered programs for the management of the renewable natural resources within its watersheds. TRCA manages land in and around floodplains and other sensitive areas through land use planning and regulations. Their jurisdiction extends from the mouth of Etobicoke Creek in Mississauga (west) to the mouth of Carruthers Creek near Ajax (east) and north to Mono and Uxbridge townships to Lake Ontario.

TRCA spearheaded the campaign to build a series of dams on Toronto area waterways, plus obtained permission and funds to purchase properties on the Hazel floodplain to conserve the land for the river. The flood control plan would help to ensure that another Hazel-like event on the Humber River basin would not be so catastrophic.

As a partnership organization, with support from all levels of government, businesses and individuals, TRCA has been able to make great strides in improving the health of the watersheds within their jurisdiction.

For further information on TRCA consult their website at http://www.trca.on.ca/ or write to them at 5 Shoreham Drive, Downsview, Ontario, M3N 1S4, Canada. Ph: (416) 661-6600 Fax: (416) 661-6898 Email: info@trca.on.ca.

PHOTO ALBUM

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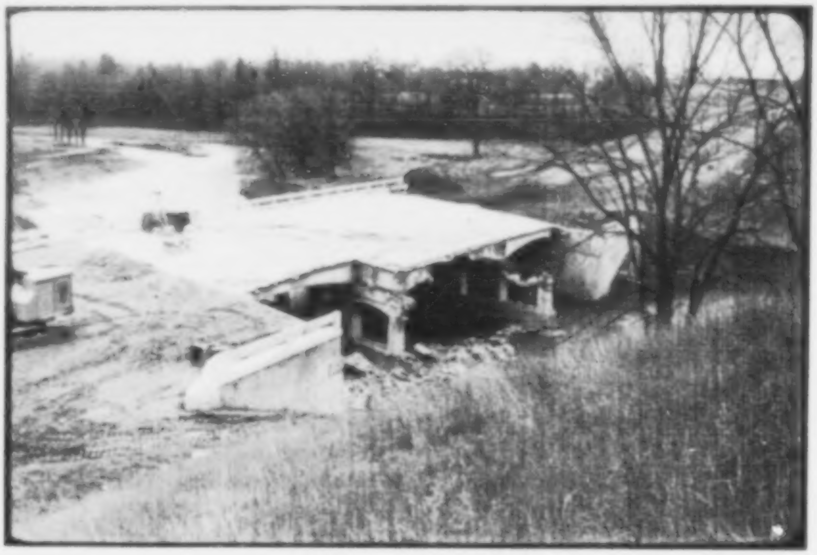
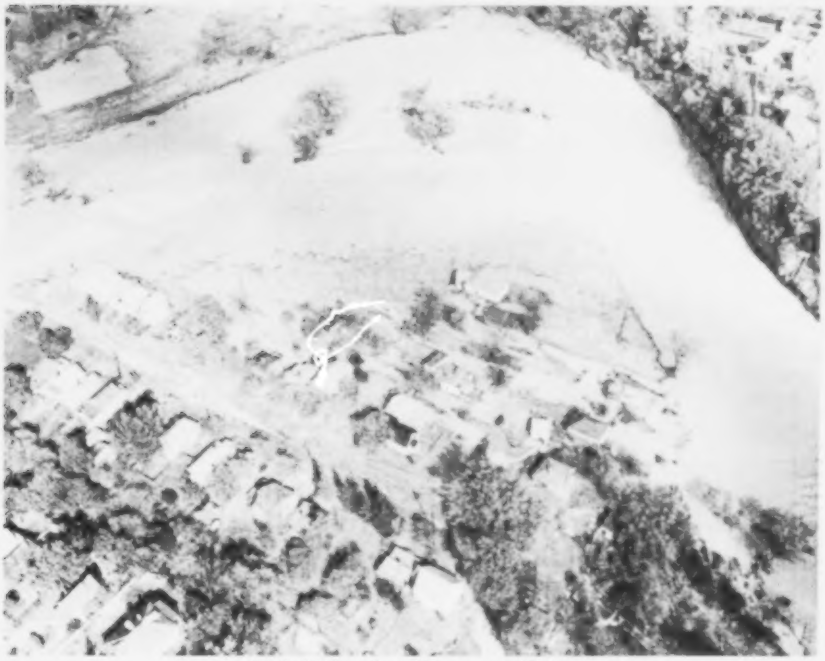


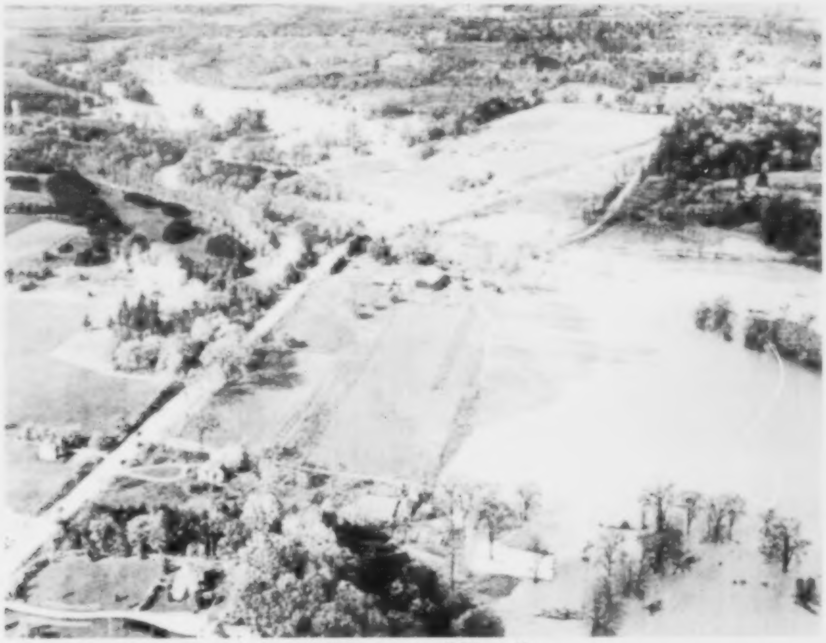
401 Highway at Albion



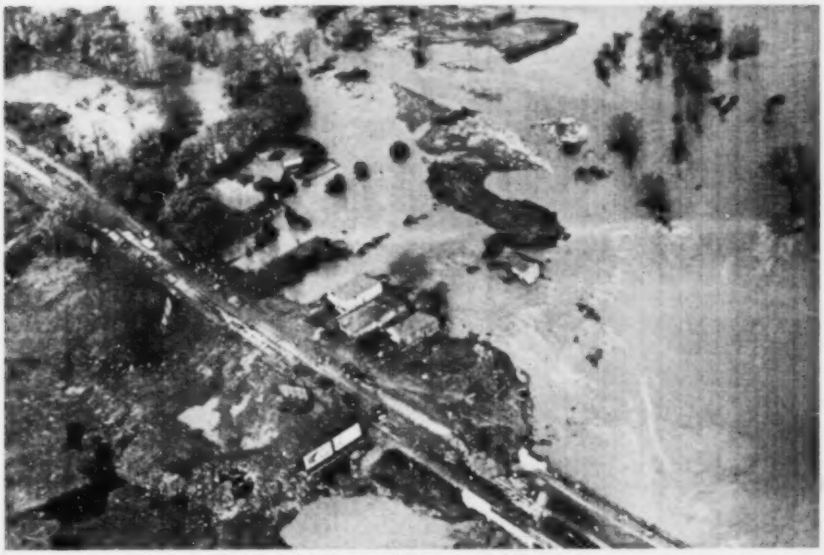
Aerial Flood at Raymore Drive

Aerial Picture of Flooding

Aerial Survey of Flooded Houses



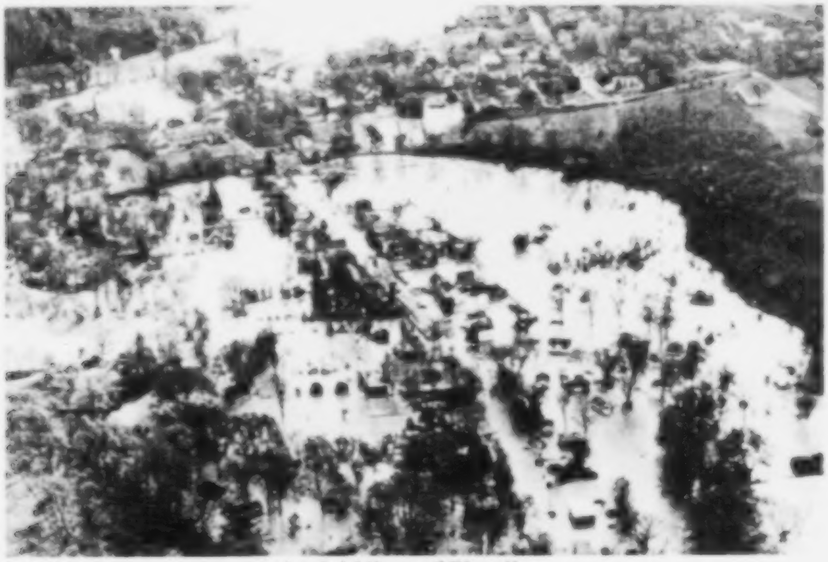
Aerial Survey of Flooding



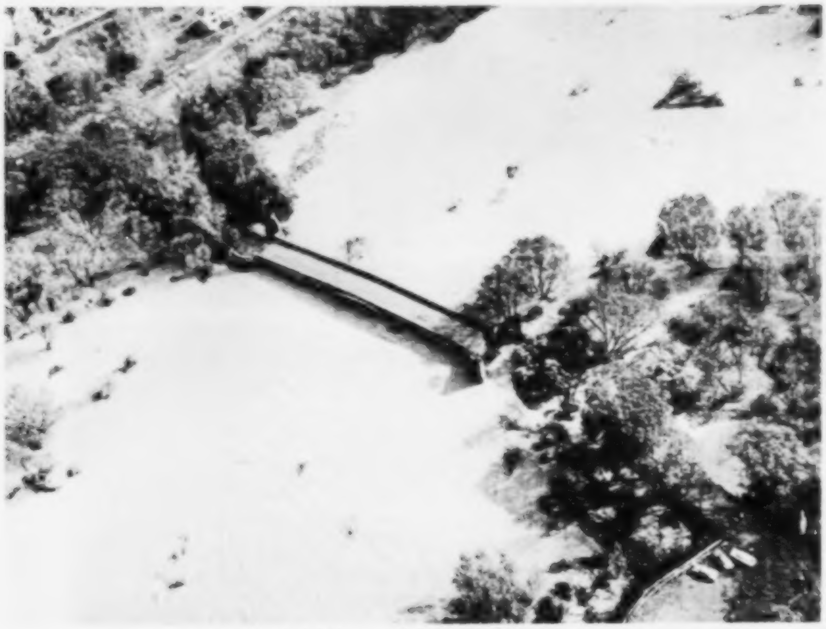
Aerial View of Damaged Bridge

Aerial View of Flooded Humber

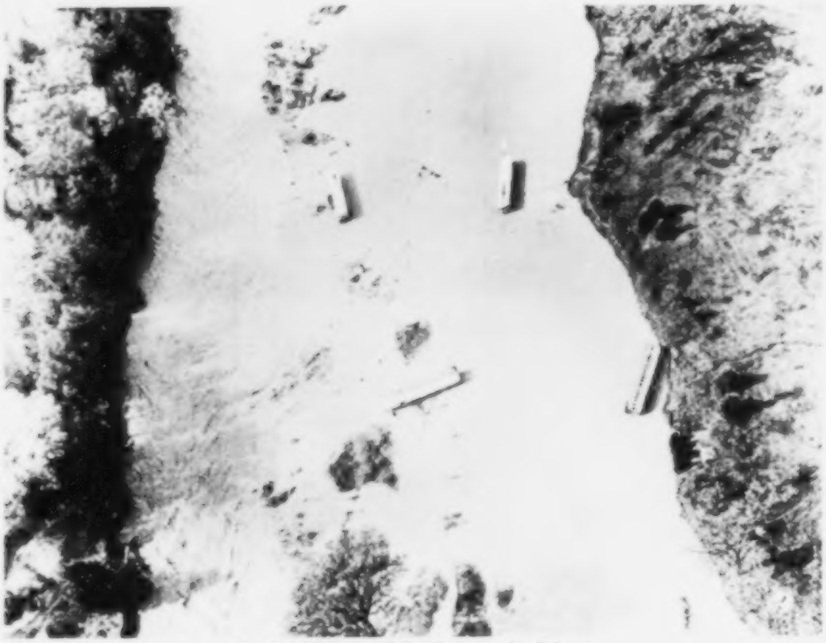
Aerial View of Flooded Marsh



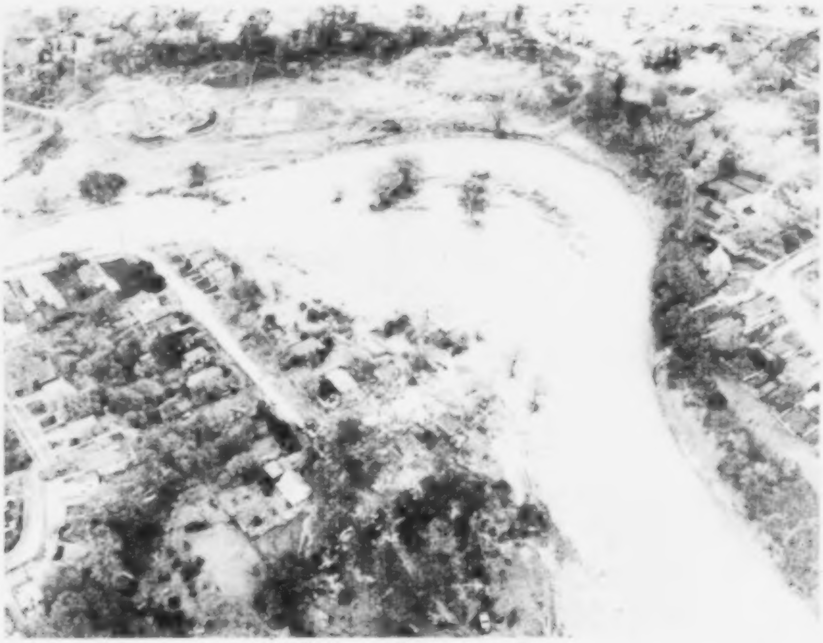
Aerial View of Flooding



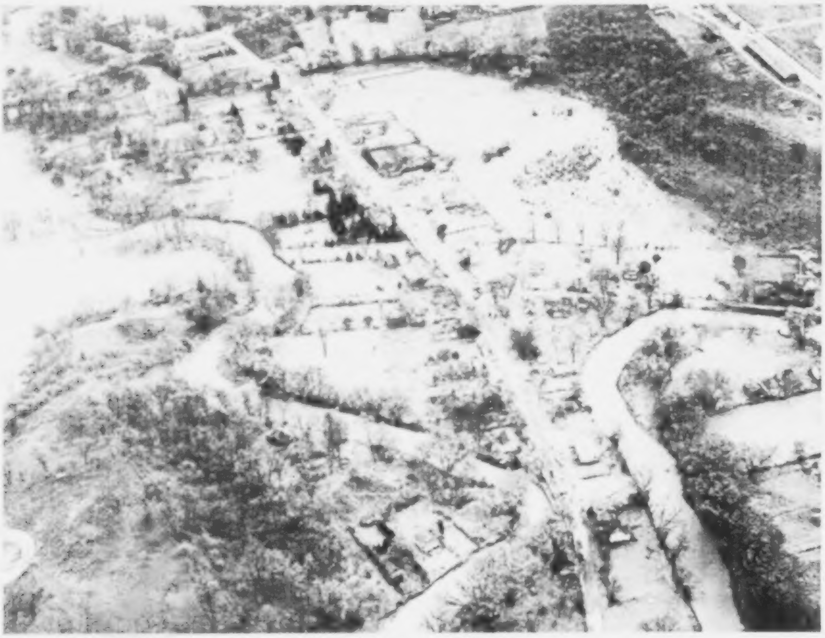
Aerial View of Old Mill Bridge



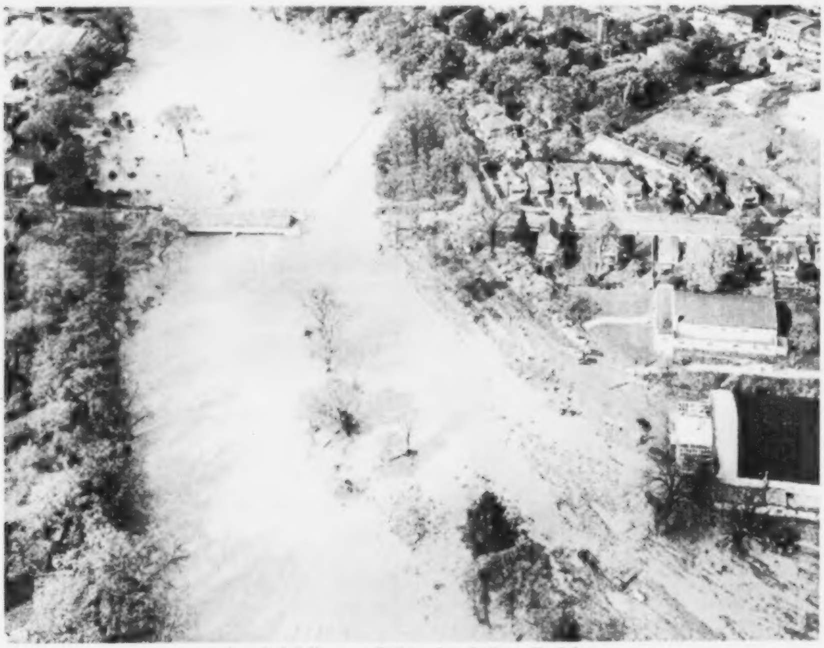
Aerial View of Rail Cars in River



Aerial View of Raymore Drive



Aerial View of River



Aerial View of Washed Out Bridge

Boat Rescues

Burning Debris

Canal Road in Holland Marsh

Car Buried in Mud

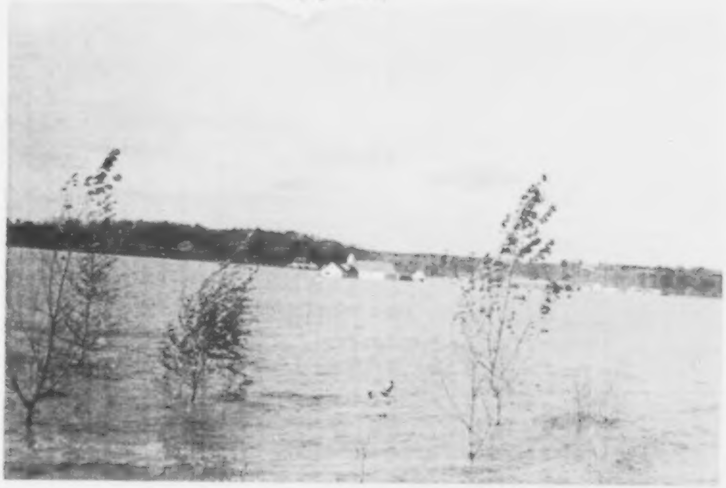
Car in Flood

Car in Trees

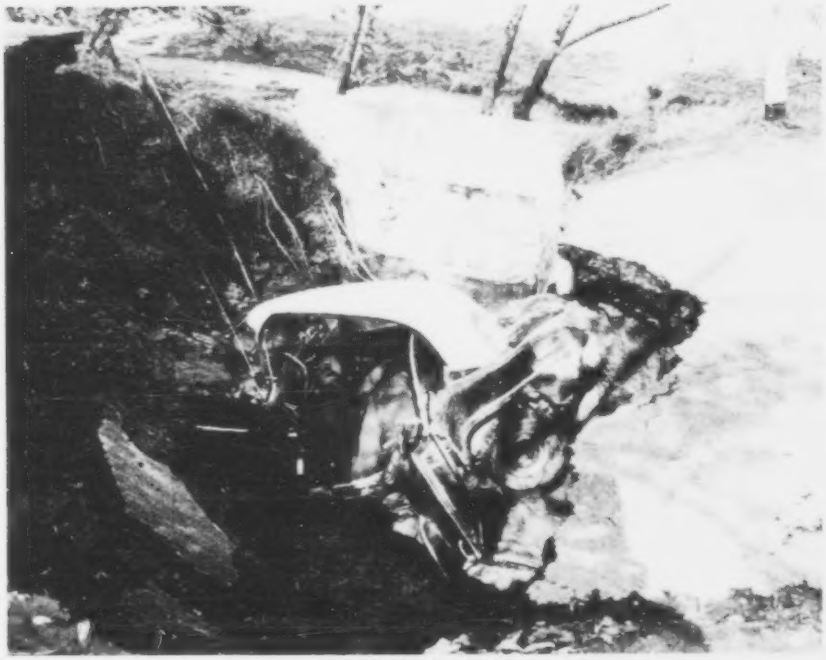
Car Under the Humber

Child on Holland Marsh

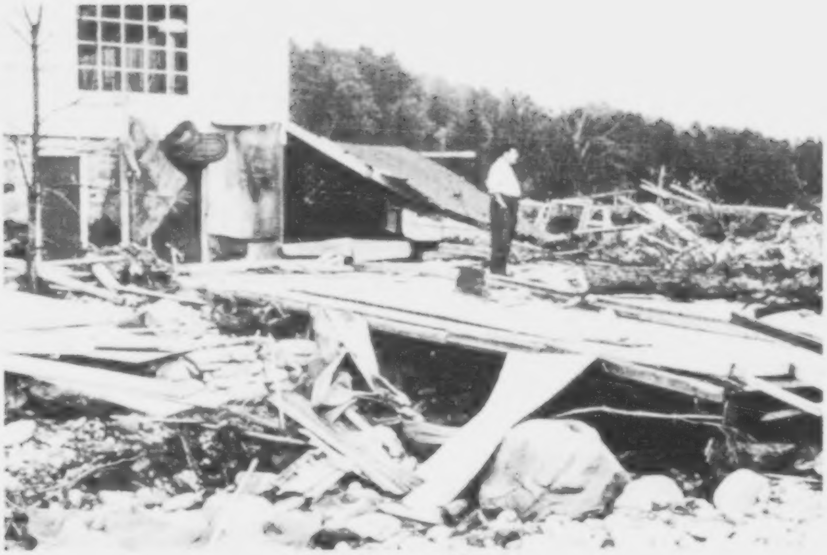
NOV '54



Church on Holland Marsh

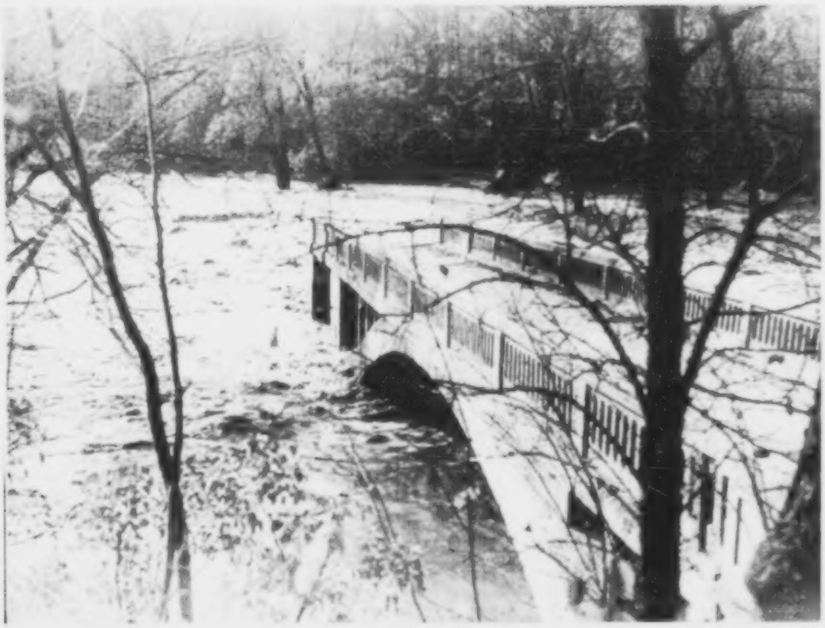


Crushed car
(Archives of Ontario RG 14 B-10-2 #422, 6 used with permission courtesy of Jim Gillford)

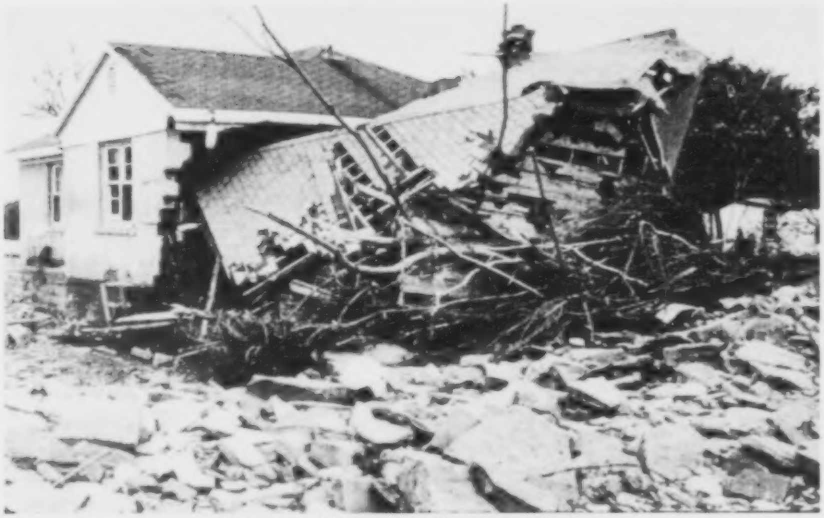


Damage to a House

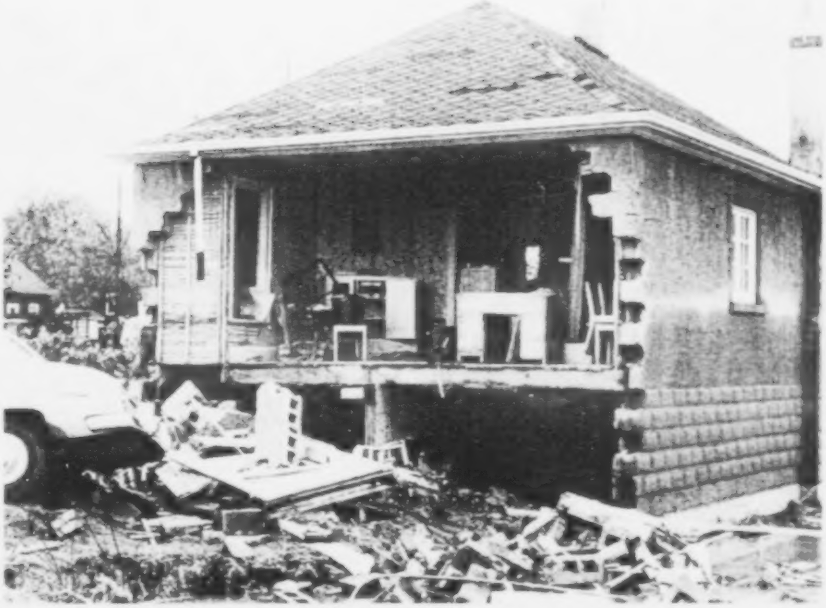
Damaged Belongings



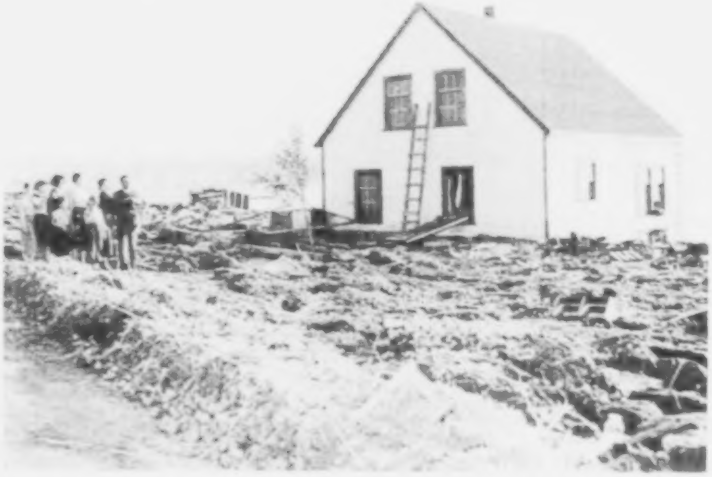
Damaged Bridge



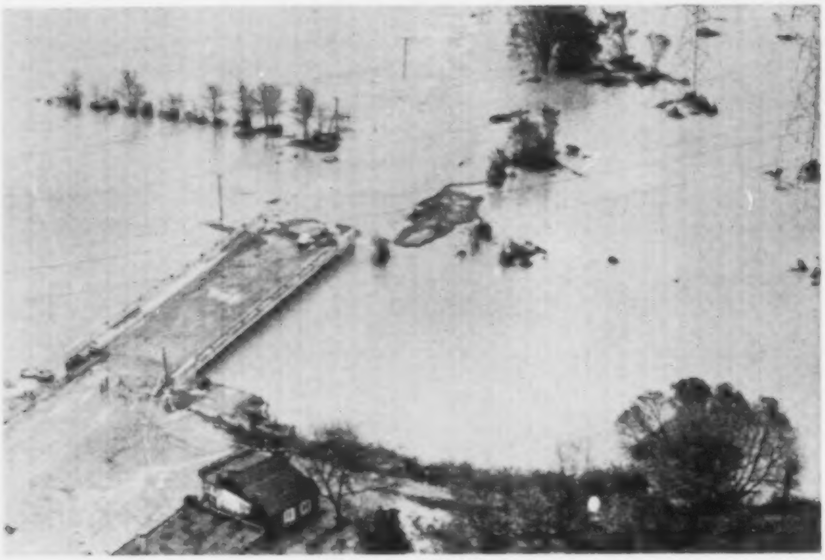
Damaged House at Raymore Drive



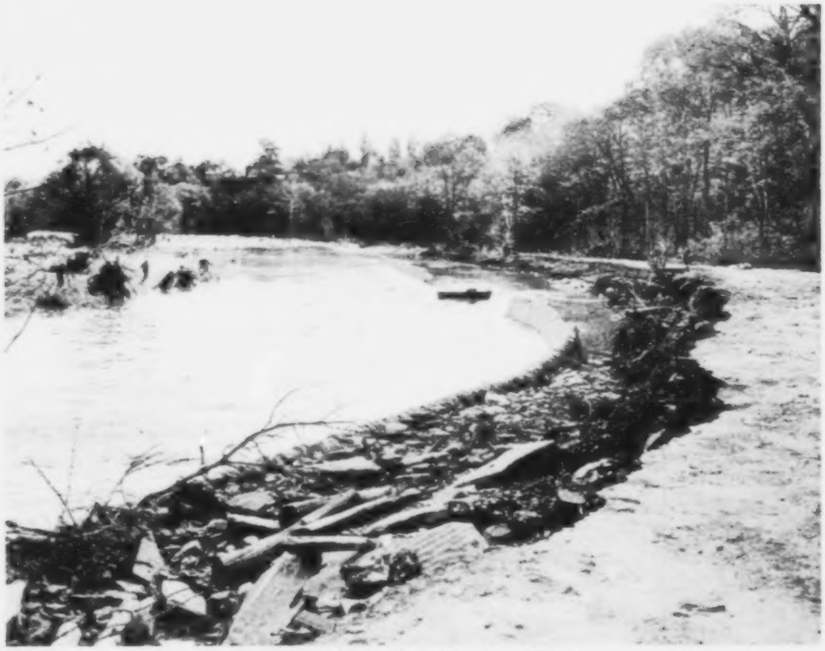
Damaged House



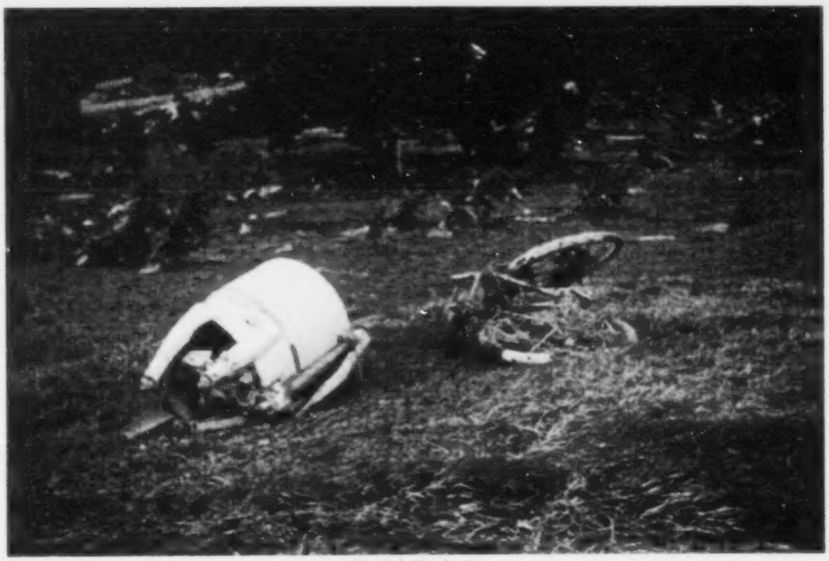
DePeuter House after the Flood



Destroyed Bridge



Erosion along the Humber River

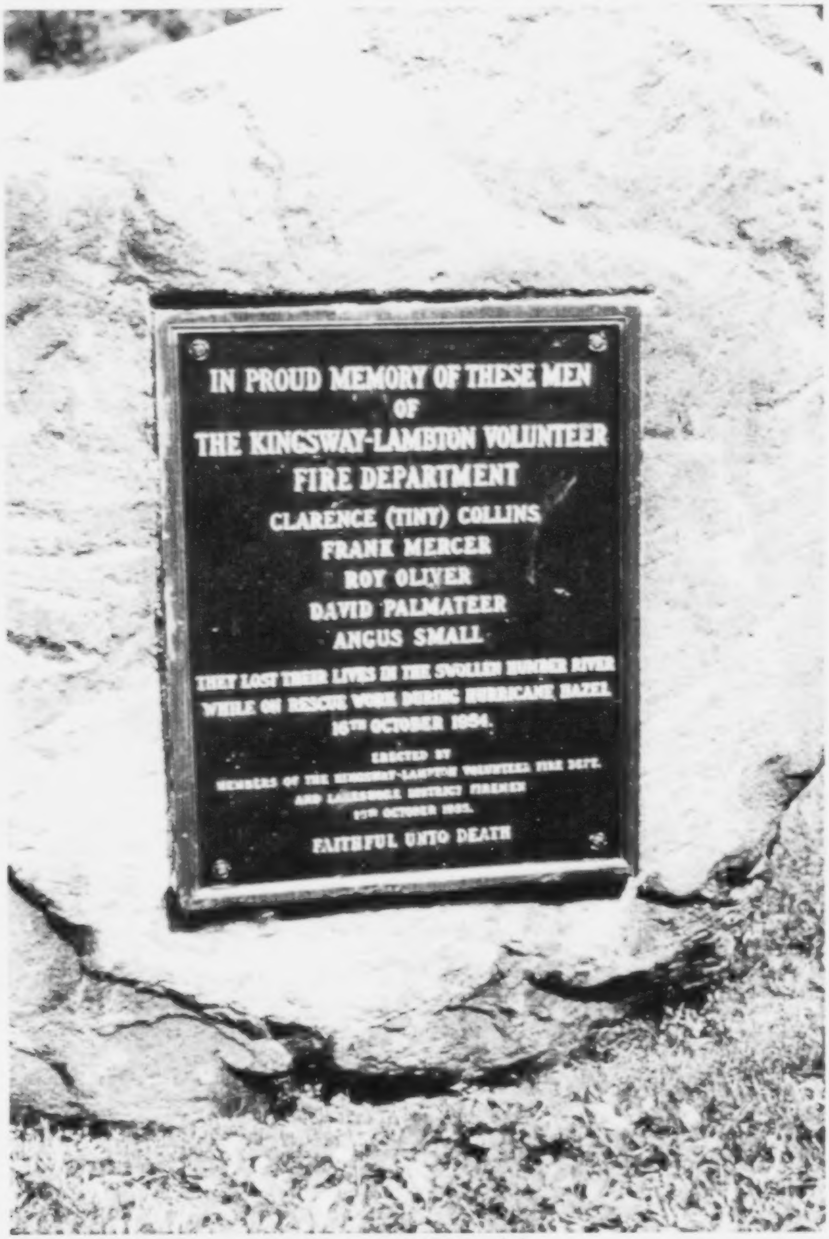


Field Debris

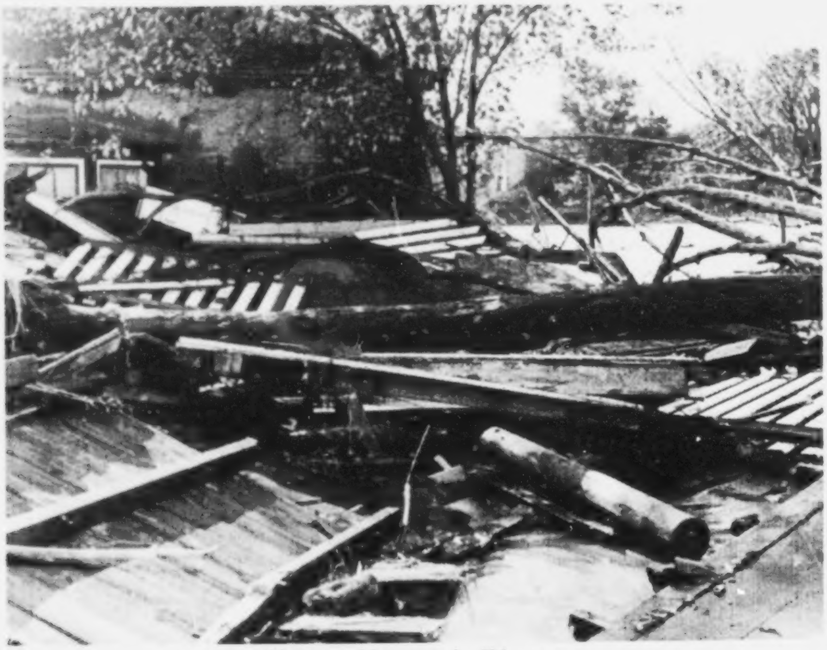
Firetruck after the Flood

IN PROUD MEMORY OF THESE MEN
OF
THE KINGSWAY-LAMBTON VOLUNTEER
FIRE DEPARTMENT
CLARENCE (TINY) COLLINS
FRANK MERCER
ROY OLIVER
DAVID PALMATEER
ANGUS SMALL
FAITHFUL UNTO DEATH

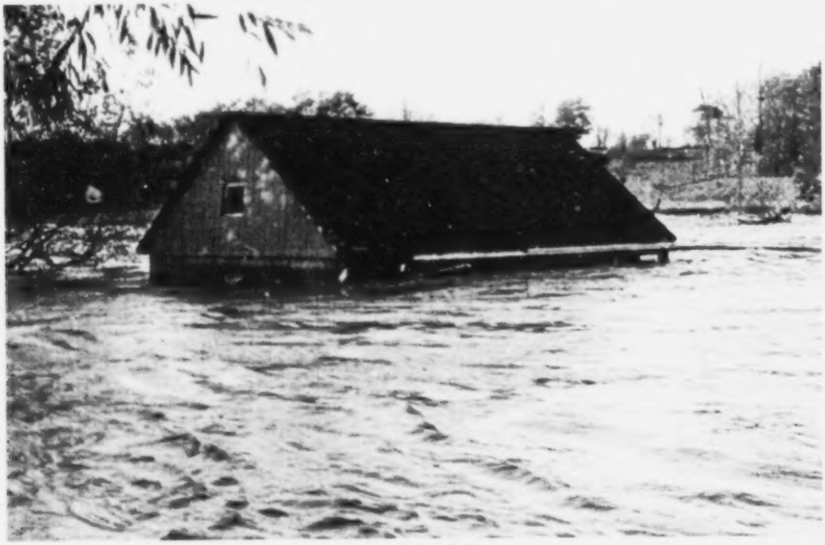
Firemen's Memorial


IN PROUD MEMORY OF THESE MEN
OF
THE KINGSWAY-LAMBTON VOLUNTEER
FIRE DEPARTMENT
CLARENCE (TINY) COLLINS
FRANK MERCER
ROY OLIVER
DAVID PALMATEER
ANGUS SMALL
THEY LOST THEIR LIVES IN THE SWOLLEN HUMBER RIVER
WHILE ON RESCUE WORK DURING HURRICANE HAZEL
16TH OCTOBER 1954.
ERECTED BY
MEMBERS OF THE KINGSWAY-LAMBTON VOLUNTEER FIRE DEPT.
AND LAKESHORE DISTRICT FIREMEN
FAITHFUL UNTO DEATH

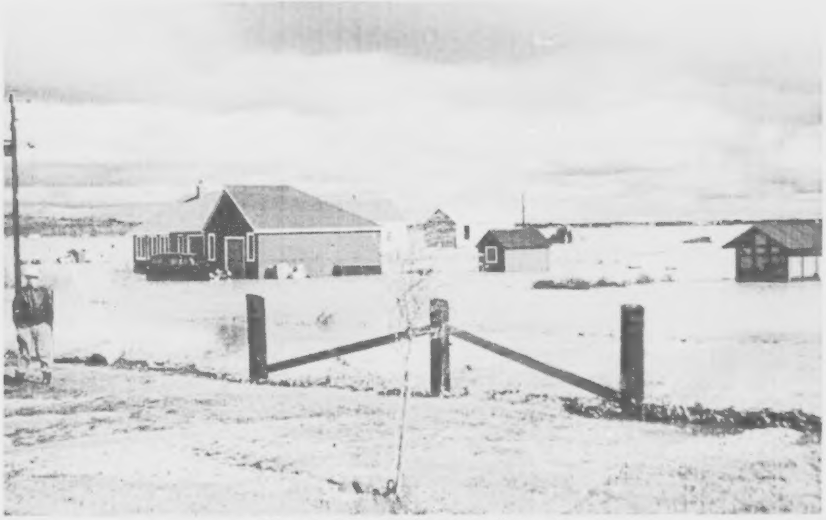
Firemen's Memorial



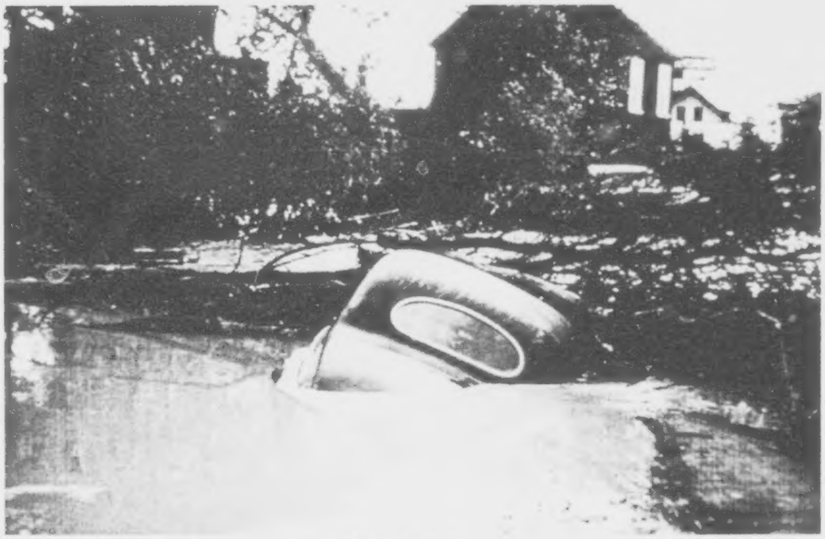
Flattened houses in Weston
(Weston Historical Society used with permission courtesy of Jim Gillford)



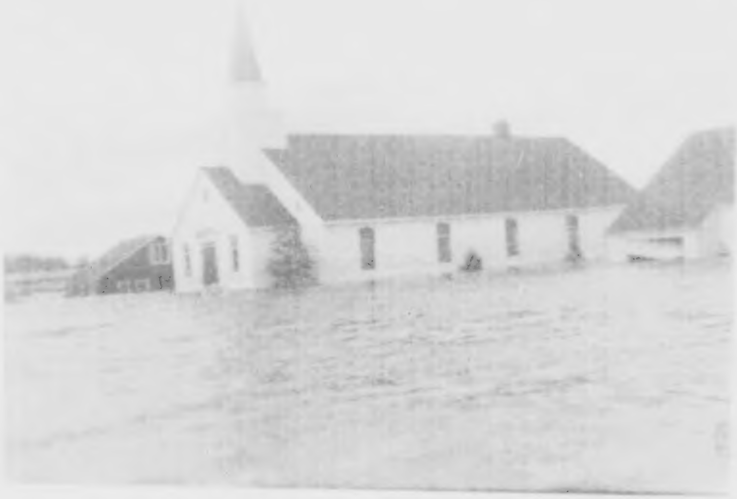
Flooded Building



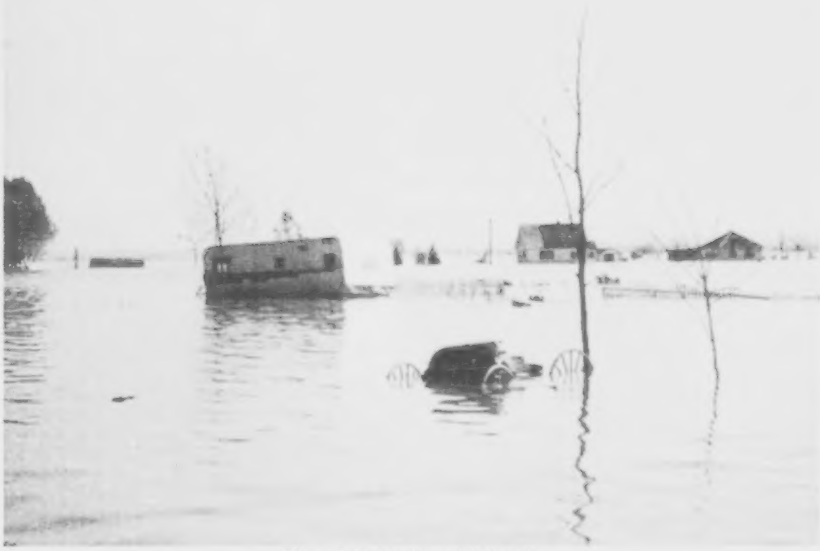
Flooded Buildings on Marsh



Flooded Car



Flooded Church



Flooded Holland Marsh

Flooded House on Marsh

Flooded Houses

Flooded Humber at Raymore Drive

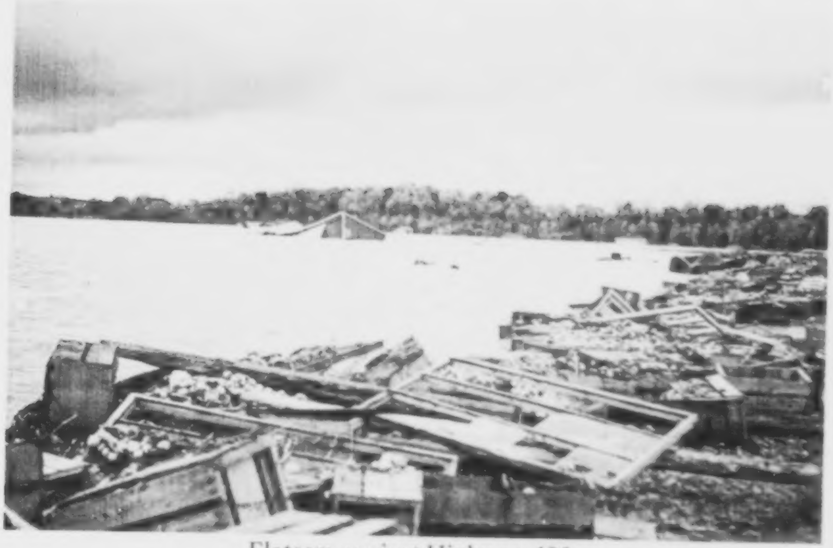
Flooded Humber River

Flooded King Street on Marsh

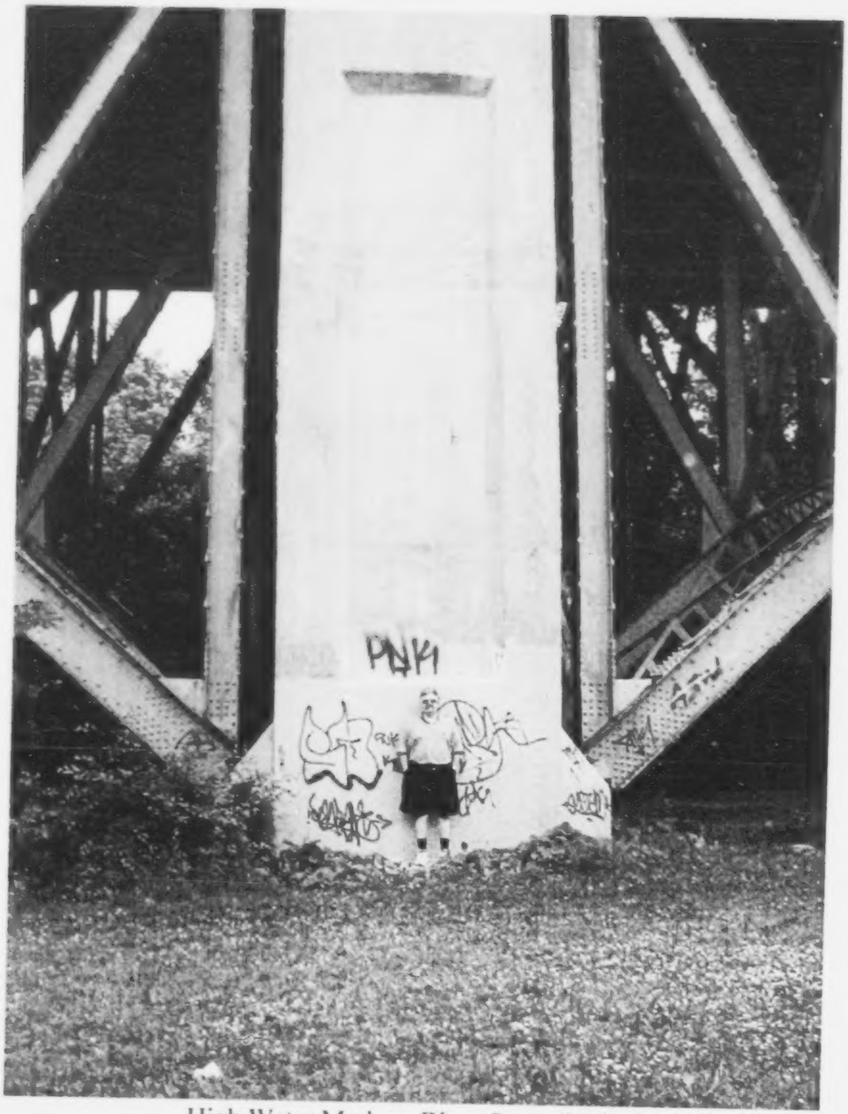
Flooded Marsh

Flooded Trailer Park

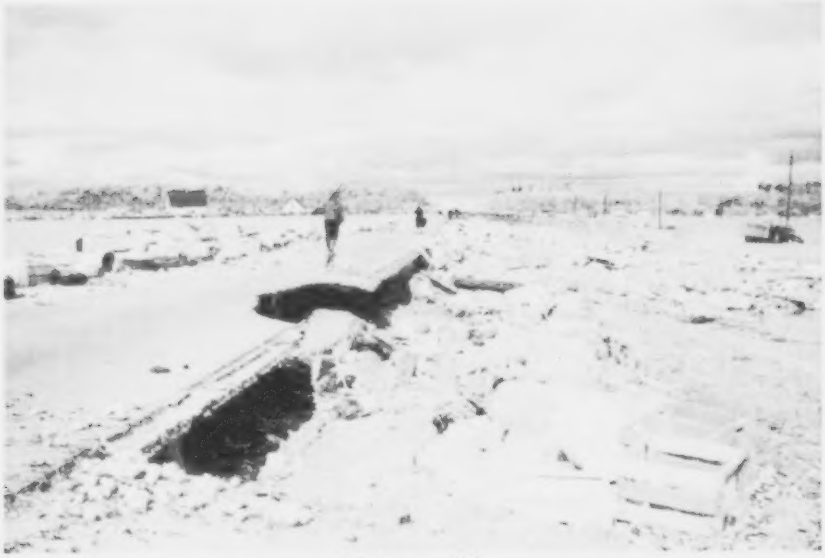
Flooding



Flotsam against Highway 400



High Water Mark on Bloor Street Bridge
(Photo: Rebecca Hanson)

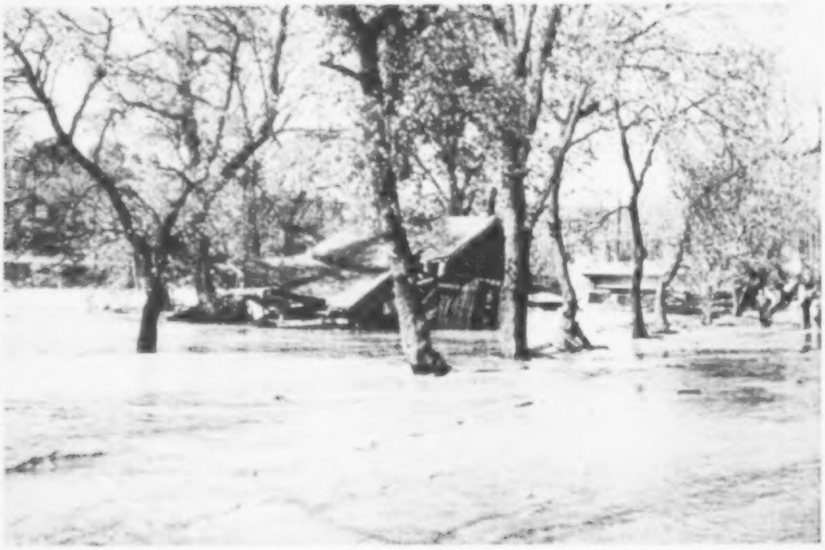


Highway 400

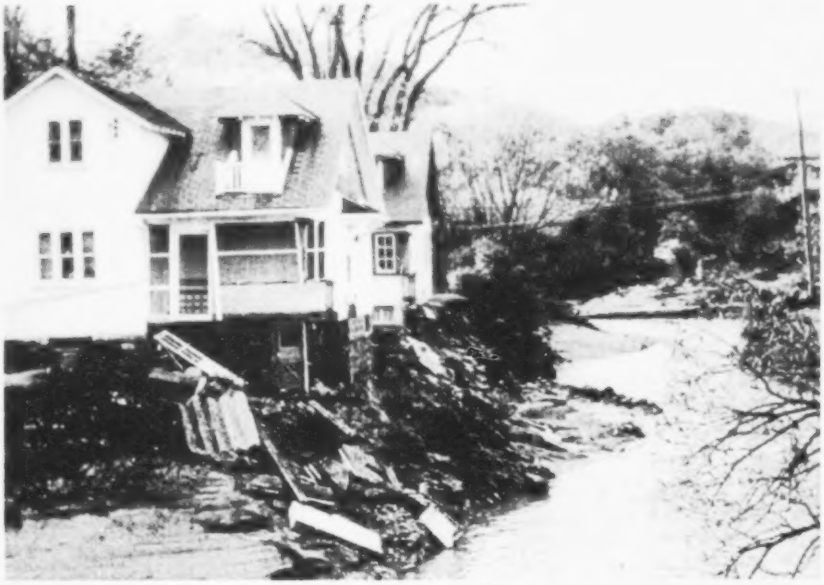
Holland Marsh Flat Farmland
(Photo: Peter Bowyer)

House Being Returned to Foundation

House Damage



House in Flood

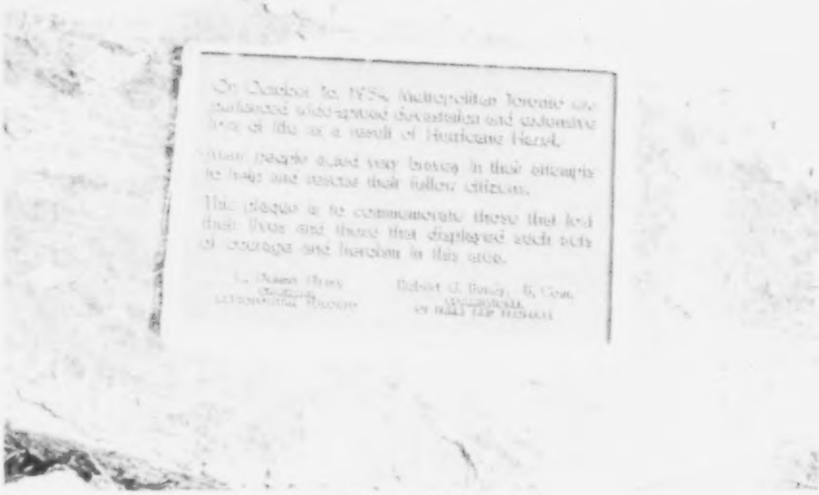


Houses along the River

Houses in River

Humber River Recovery Operations

Hurricane Hazel Relief Fund
(Roy Mitchell / National Archives of Canada / RD931)



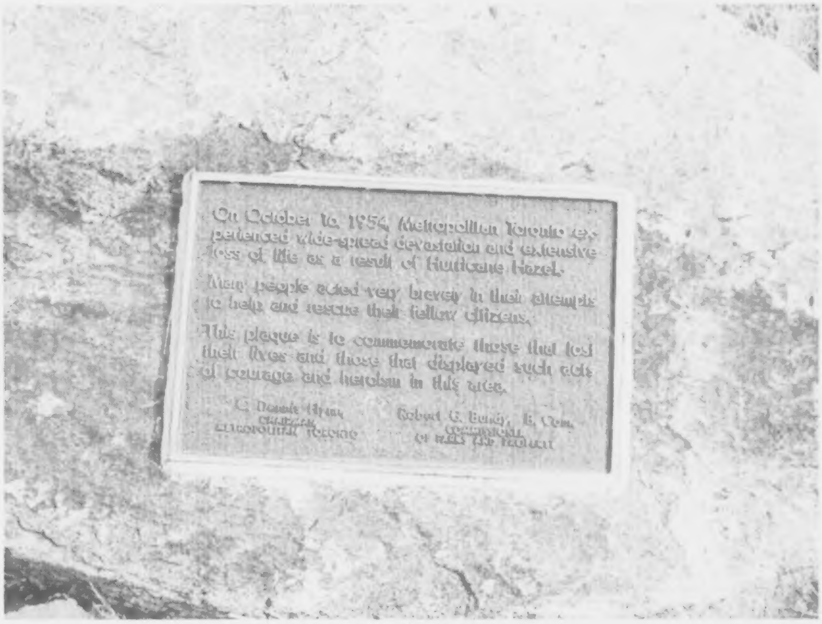
On October 15, 1954, Metropolitan Toronto experienced wide-spread devastation and extensive loss of life as a result of Hurricane Hazel.

Many people acted very bravely in their attempts to help and rescue their fellow citizens.

This plaque is to commemorate those that lost their lives and those that displayed such acts of courage and heroism in this area.

Long Branch Memorial
(Photo: Peter Bowyer)

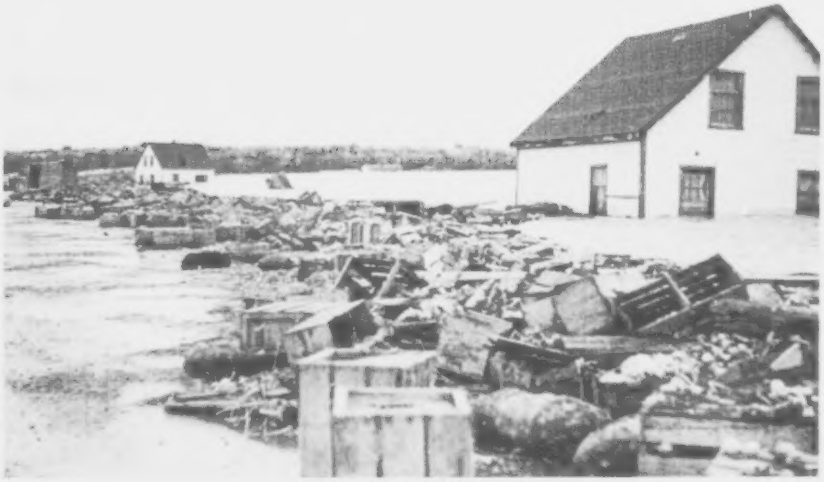
Hurricane Hazel Relief Fund
(Roy Mitchell / National Archives of Canada / RD931)


On October 16, 1954 Metropolitan Toronto experienced wide-spread devastation and extensive loss of life as a result of Hurricane Hazel.
Many people acted very bravely in their attempts to help and rescue their fellow citizens.
This plaque is to commemorate those that lost their lives and those that displayed such acts of courage and heroism in this area.
C. Dennis Flynn
Chairman
Metropolitan Toronto
Robert G. Bundy, B. Com.
Commissioner
of Parks and Property

Long Branch Memorial
(Photo: Peter Bowyer)

METRO PARKS & CULTURE
MARIE CURTIS PARK

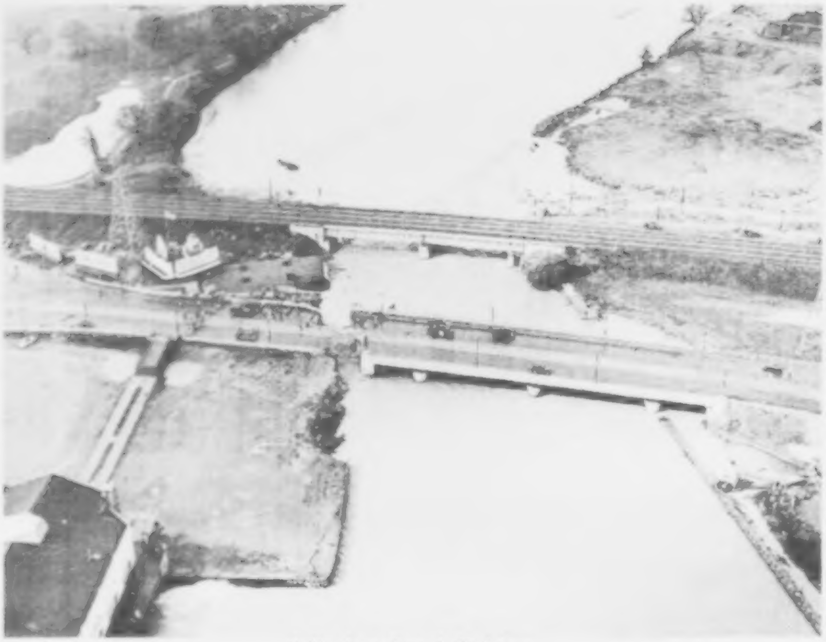
Marie Curtis Park Sign
(Photo: Peter Bowyer)



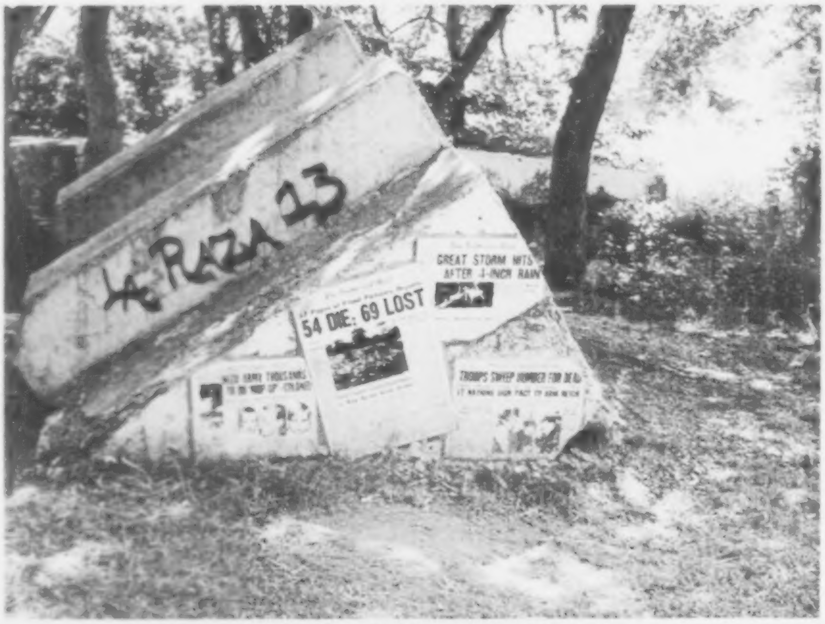
Marsh Debris

Marsh Flooding

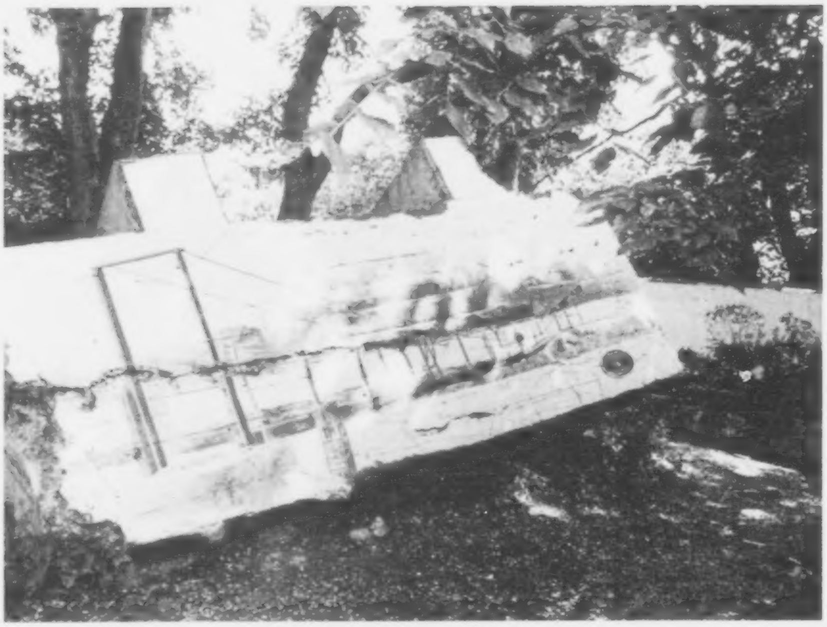
Military Rescue Vehicle



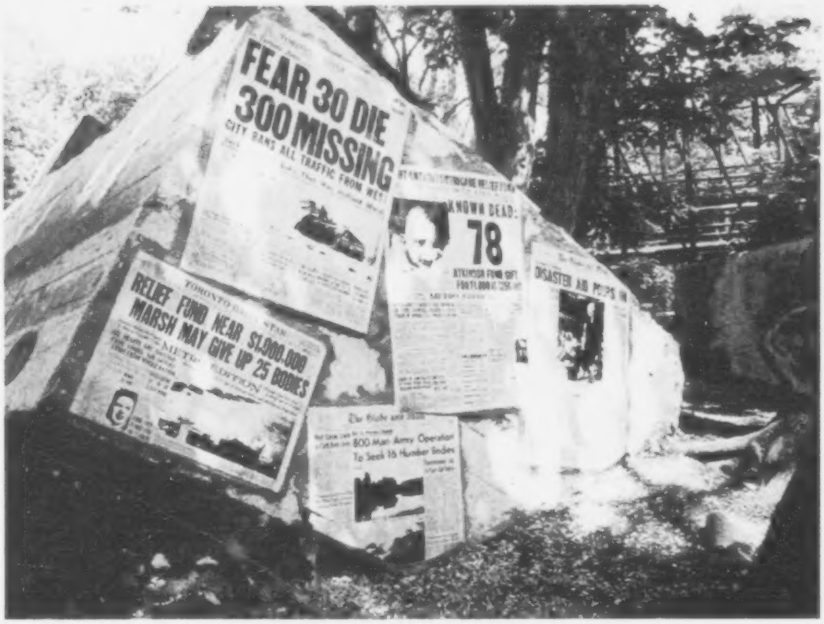
Mimico Creek Bridge


LA RAZA 13
GREAT STORM HITS AFTER 4-INCH RAIN
54 DIE; 69 LOST
TROOPS SWEEP HUMBER FOR DEAD

Mural on Bridge Abutment
(Photo: Peter Bowyer)

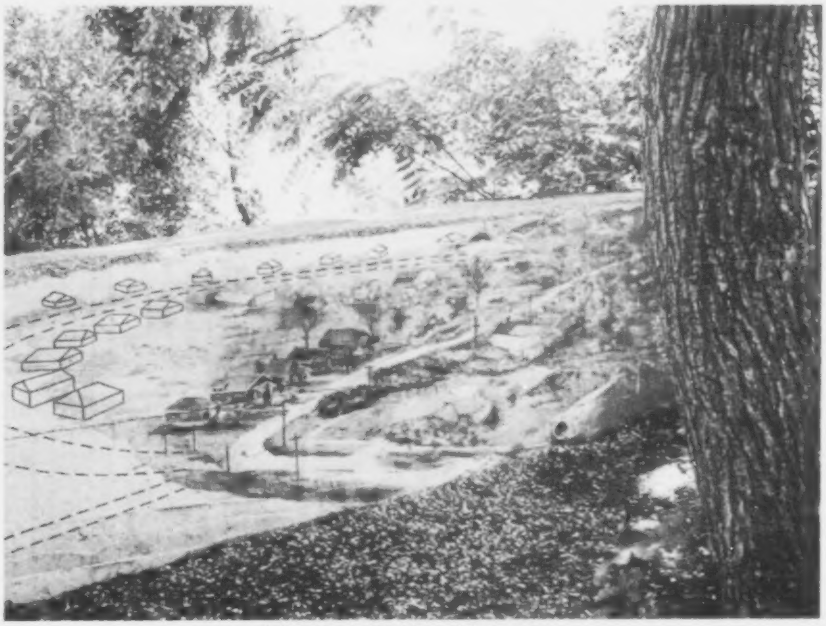


Mural on Bridge Abutment
(Photo: Peter Bowyer)

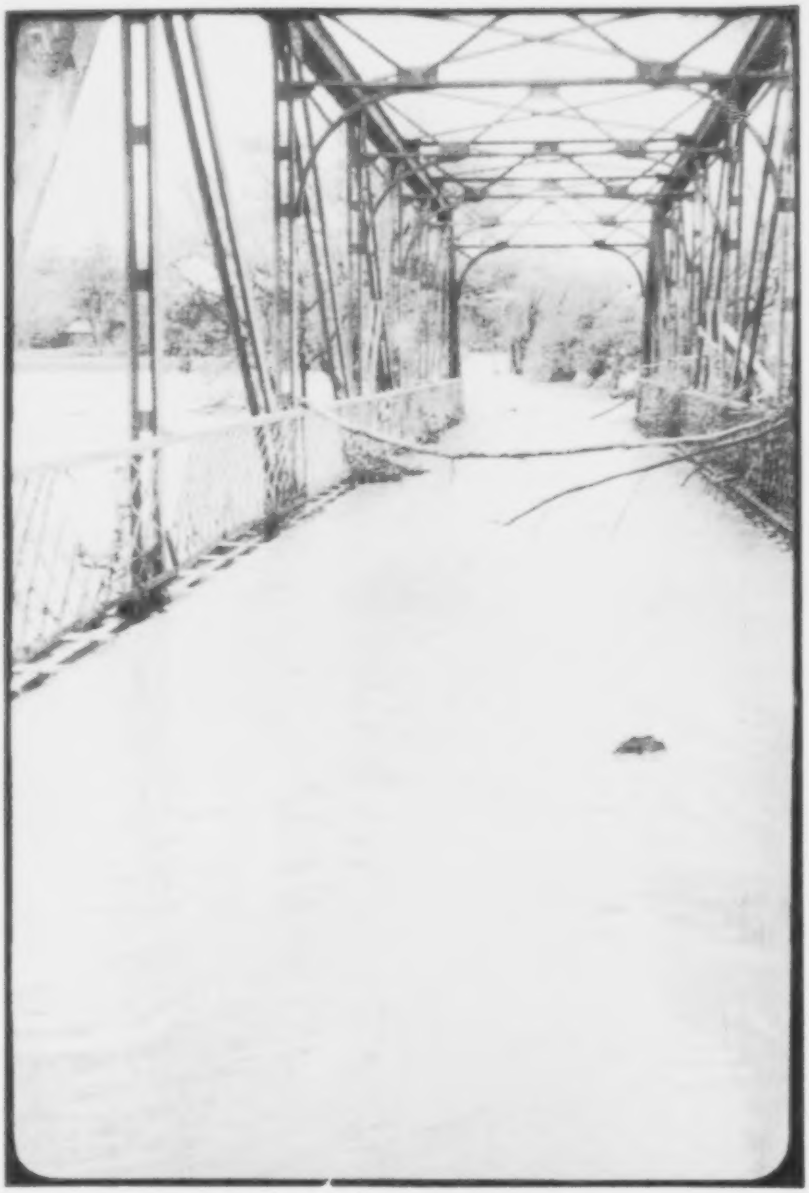

FEAR 30 DIE
300 MISSING
CITY BANS ALL TRAFFIC FROM WEST
KNOWN DEAD:
78
DISASTER AID POURS IN
TORONTO DAILY STAR
RELIEF FUND NEAR $1,000,000
MARSH MAY GIVE UP 25 BODIES
METRO EDITION
The Globe and Mail
800-Man Army Operation
To Seek 16 Number Bodies

Mural on Bridge Abutment
(Photo: Peter Bowyer)

Mural on Bridge Abutment
(Photo: Peter Bowyer)



Mural on Bridge Abutment
(Photo: Peter Bowyer)



Old Albion Bridge

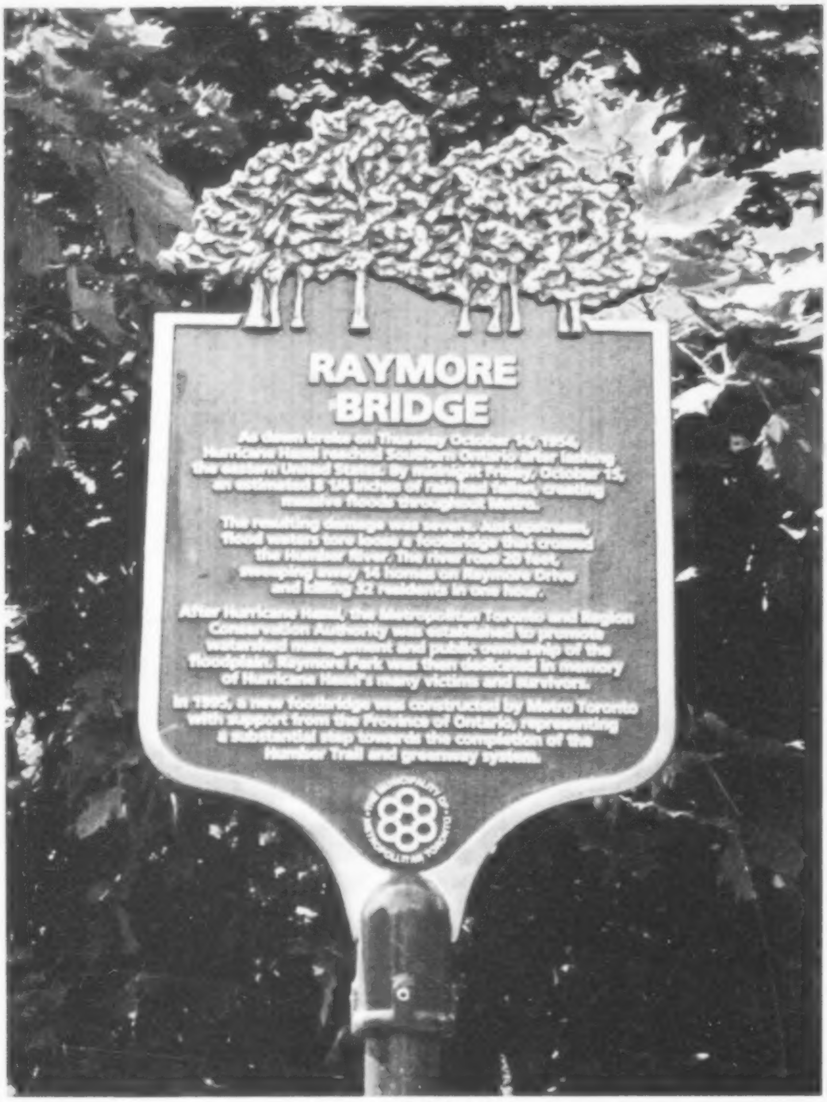
Old Mill Bridge

Operation Mop-up Pumps

Police Guarding Washed Out Road

Pumps on the Marsh

Rail Cars in River



RAYMORE BRIDGE

As dawn broke on Thursday October 14, 1954, Hurricane Hazel reached Southern Ontario after lashing the eastern United States. By midnight Friday, October 15, an estimated 8 1/4 inches of rain had fallen, creating massive floods throughout Metro.

The resulting damage was severe. Just upstream, flood waters tore loose a footbridge that crossed the Humber River. The river rose 20 feet, sweeping away 14 homes on Raymore Drive and killing 32 residents in one hour.

After Hurricane Hazel, the Metropolitan Toronto and Region Conservation Authority was established to promote watershed management and public ownership of the floodplain. Raymore Park was then dedicated in memory of Hurricane Hazel's many victims and survivors.

In 1995, a new footbridge was constructed by Metro Toronto with support from the Province of Ontario, representing a substantial step towards the completion of the Humber Trail and greenway system.

Raymore Bridge Sign
(Photo: Peter Bowyer)

Raymore Drive Sign

Recovery Efforts

Recovery on the Marsh

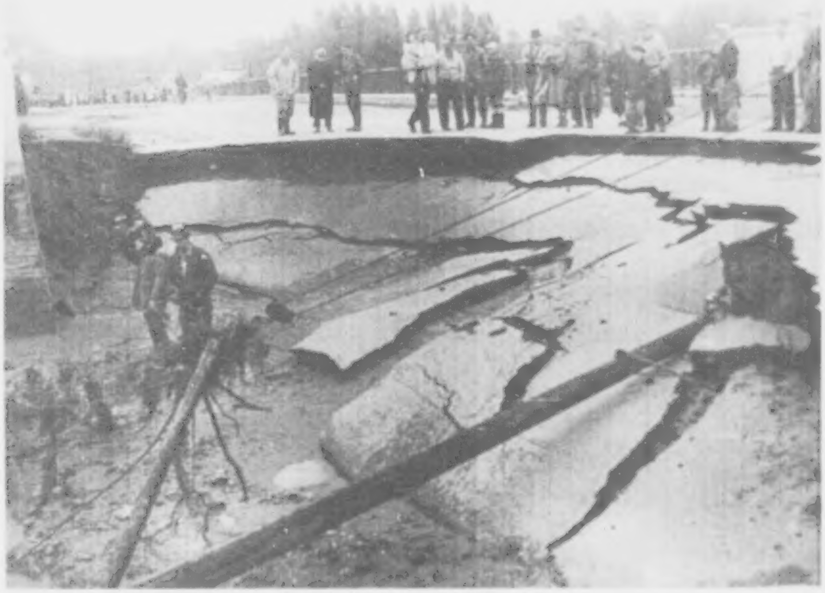
Recovery Operations at the Bloor Street Bridge

Recovery Operations

Rescue Operations on the Humber River

Rescue Operations

Rescuer in Flood



Road damage in Weston
(Weston Historical Society used with permission courtesy of Jim Gillford)

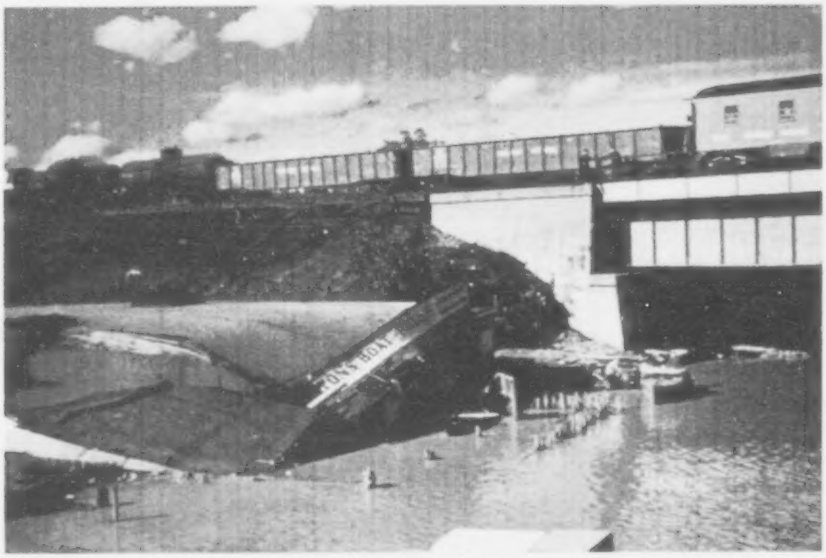
Road Washed Out

Rouge River Funland

Ruined Vegetables in the Marsh

Rupke Road Homes in Flood

Searching Debris on the Humber River



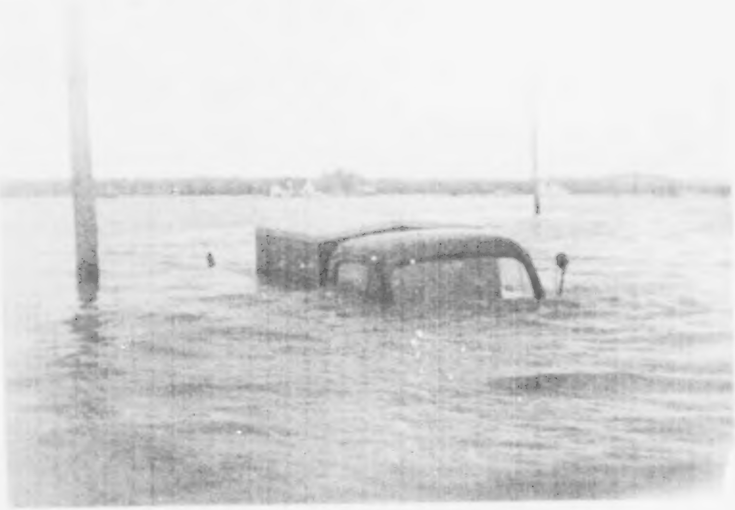
Smashed Boat House

Smashed Building

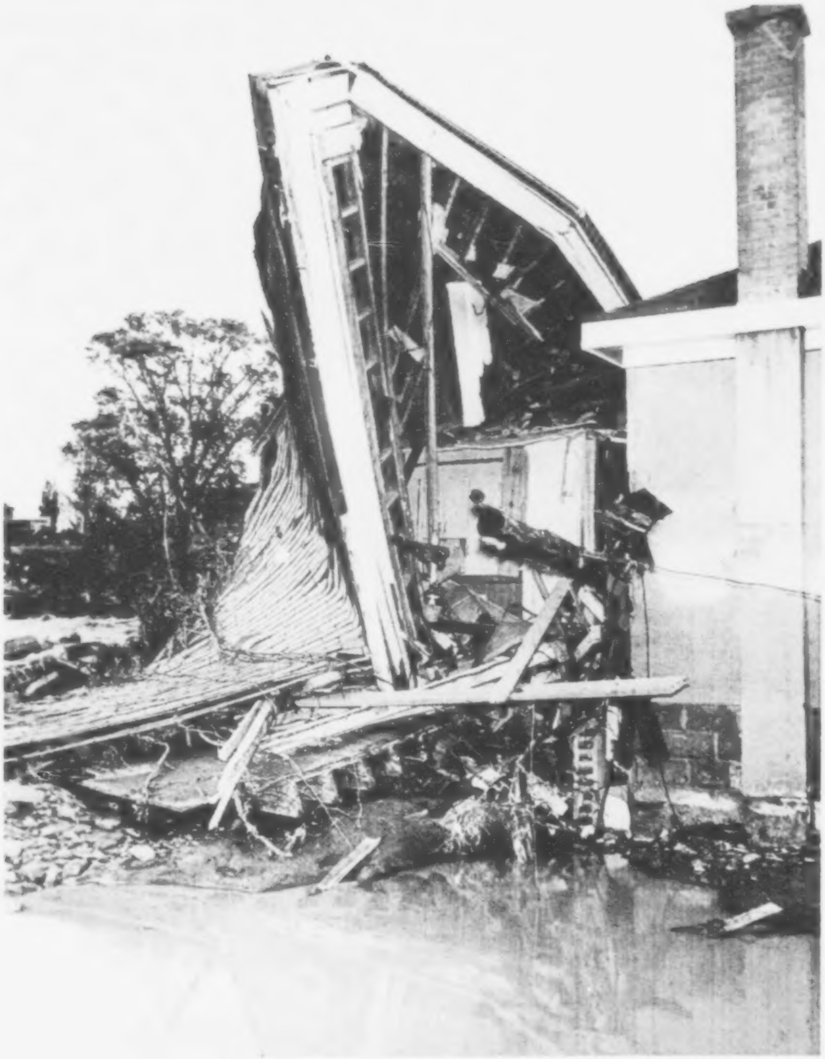
Store Damaged in Flood

Survey of Flooding

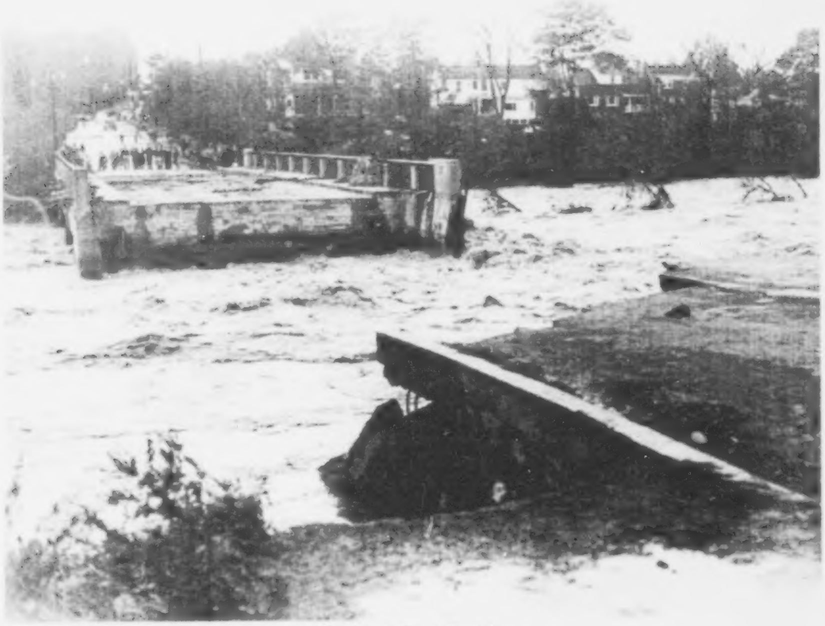
Survey of River Flooding



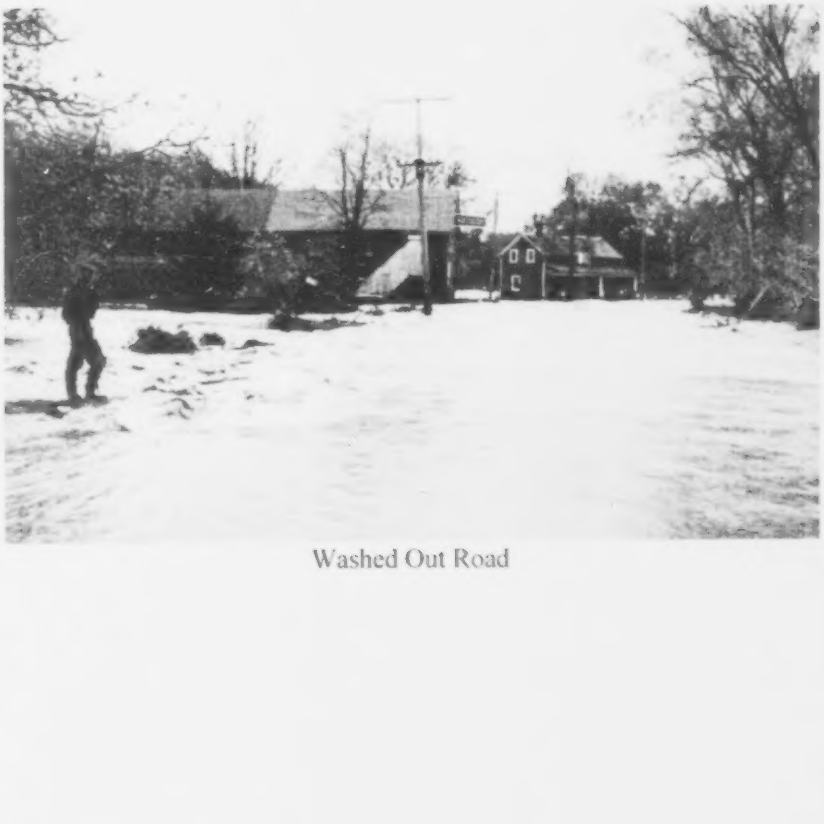
Truck on Marsh



Twisted house on Raymore Drive
(Toronto Police Museum used with permission courtesy of Jim Gillford)



Washed Out Bridge

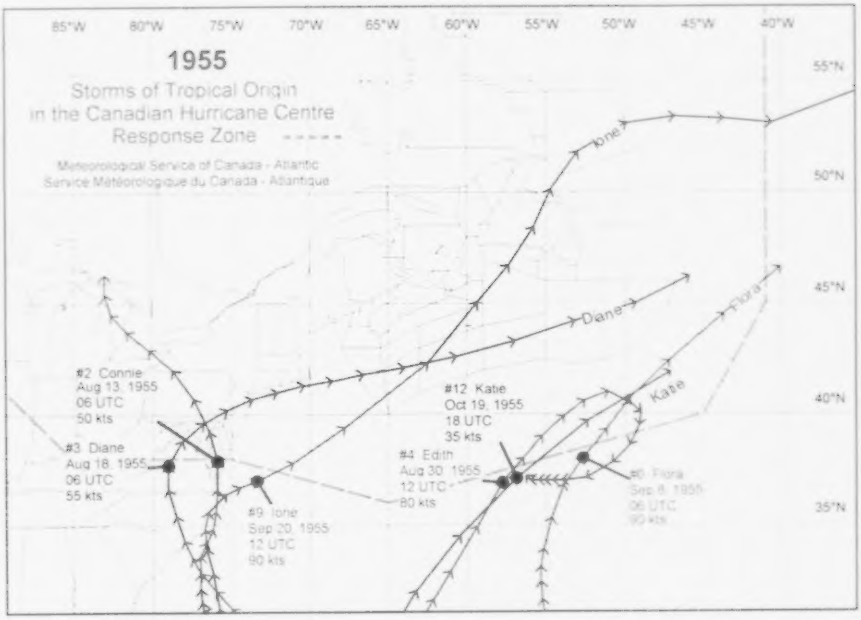


Washed Out Road

Where the Houses Were

Woman on the Marsh

1955 – MAP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1955
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Ione
Diane
Flora
Katie
#2 Connie
Aug 13, 1955
06 UTC
50 kts
#3 Diane
Aug 18, 1955
06 UTC
55 kts
#9 Ione
Sep 20, 1955
12 UTC
90 kts
#12 Katie
Oct 19, 1955
18 UTC
35 kts
#4 Edith
Aug 30, 1955
12 UTC
80 kts
#6 Flora
Sep 8, 1955
06 UTC
90 kts

1955–Connie † (3 Canadian fatalities)

Connie made landfall in Ontario as a tropical depression with winds of 56 km/h (30 knots) on August 14th.

Connie developed into a hurricane off the Cape Verde Islands on August 3, 1955. This large category four hurricane had winds of 232 km/h (125 knots). Connie tracked north, making landfall in New England on August 14th and moved into Ontario through Lake Erie as a 56 km/h (30-knot) tropical depression near midnight August 13-14. **Three casualties were reported** and damage to property in Ontario was great. The storm quickly lessened and was no longer visible on August 15th near Elliot Lake, Ontario.

ONTARIO

August 15, 1955

- One man drowned after being swept into Lake Ontario from Toronto harbour (MG)
- One man drowned in Haliburton Lake (TS)

- The fishing vessel, *Irac* went down in Lake Erie, one man drowned (TS)
- 75 km/h (44 knots) winds and 65 mm (2.5 in) of rain to the Great Lakes (TS)
- *$20,000* naval harbour tug sunk near Hamilton (TS)
- 25 small motor boats and two sail boats were destroyed in the Burlington area (TS)
- Heavy damage to tobacco farms in Elgin County (MG)
- Tents blown down that were set up for the Jamboree Scout Camp at Niagara-on-the-Lake (MG)
- Lady spent 22 hours in Lake Ontario, but survived (TS)
- Five cottages destroyed at Van Wagner's Beach and one cottage damaged on Crescent Beach (TS)
- Cottages damaged in Hamilton area by 3.6 m (12 ft) waves (TS)
- Power outages through out southern Ontario (TS)

1955–Diane

On August 7, 1955, the disturbance that would become Diane was located northeast of the Leeward Islands, east of Barbados. Diane packed maximum winds of 195 km/h (105 knots) and entered the CHC Response Zone through New England on August 18th. Diane continued eastward entering southwestern Canadian waters shortly after midnight on August 20th as a marginal tropical storm with winds of 65 km/h (35 knots). This storm passed well south of Canada and did not have any impact on inland areas. It left the eastern edge of the CHC Response Zone early on August 22nd.

1955–Edith

Hurricane Edith formed on August 24, 1955, in an easterly wave and moved on a smooth oblong curve passing well to the east of Bermuda on August 29th. Maximum winds achieved were 157 km/h (85 knots). Edith remained at sea and did not affect Canada.

1955–Flora

A weak circulation off the Cape Verde Islands on August 30, 1955 was the beginning of Hurricane Flora. Flora reached hurricane intensity on September 3rd, with winds of 167 km/h (90 knots). The hurricane moved along a smooth track through the mid-Atlantic. Hurricane Flora remained at sea when it entered the CHC Response Zone on September 8th and passed east of the Grand Banks. The storm had no affect on Canada before it left the CHC Response Zone on the afternoon of September 9th.

1955–Ione

Ione made landfall over Newfoundland as tropical storm with winds of 83 km/h (45 knots) on September 21st.

Ione developed in an easterly wave that passed through the Cape Verde Islands on September 6, 1955, and the circulation was still quite weak on September 11th. At the storm's maximum, winds were 195 km/h (105 knots). Ione paralleled the United States eastern seaboard entering the CHC Response Zone at a strength of 167 km/h (90 knots) near noon on September 20th. Ione entered southwestern Canadian waters before midnight that night as a 139 km/h (75-knot) hurricane but weakened to 83 km/h (45-knot) tropical storm before making landfall on the south coast of Newfoundland on the evening of September 21st. Wind and rain damage was reported in Newfoundland, but no fatalities occurred. Ione left Canadian waters on the afternoon of September 23rd.

NEWFOUNDLAND

September 22, 1955

- Boy broke his leg after being blown into a car in Carbonear (ET)
- *Thousands of dollars* of damage in St. John's (ET)
- Broke light poles, uprooted trees, damaged chimneys, disrupted telephone service, and caused power outages in St. John's (ET)
- Roof of a Chinese laundromat on Duckworth Street blew off. Severe damage to two homes on Wood Street occurred as parts of the roof of the Chinese laundry building blew into their homes (ET)
- Other roofs of buildings in St. John's were also damage (ET)
- A 680 kg (1,500 lbs) trailer was torn from its foundation and was thrown 3 m (10 ft) on Brookfield Road in St. John's (ET)
- Schools closed thought out the province (ET)

- Torbay TransCanada airport cancelled three flights (ET)
- Ferry between Bell Island and Portugal Cove disrupted (ET)

September 23, 1955

- Several boats were lost in Carbonear (ET)
- The storm flipped over a garage with the car still in it in Harbour Grace (ET)
- Streets and two mines were flooded in Corner Brook (ET)
- *$2 million* of damage to province (ET)
- Three boats lost in Bay of Islands (ET)
- Five small fishing boats were swamped in Harbour Main (ET)
- Extensive damage to waterfront property along the southern shore of Newfoundland (ET)

September 24, 1955

- Fisherman lost gear along the south shore of Newfoundland (HH)
- House blew off its foundation in Foxtrap (HH)
- A fire caused *$150,000* of damage in Clarenville (HH)
- *$25,000* lost in fishing gear in Bay de Verde (ET)
- *$30,000* in damage to the phone company (ET)
- Road washed away in Swift Current (ET)
- *$1,000* damage to the power company (ET)

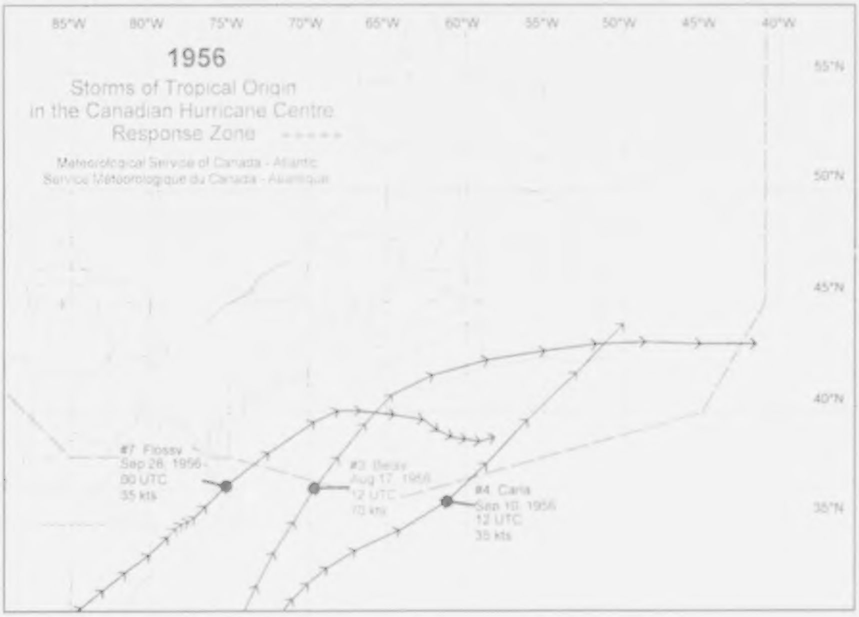
September 27, 1955

- Buoys in Harbour Grace, Fortune and Stag Harbour destroyed (ET)
- *$2,000* worth of damage done to a freighter in Conception Bay (ET)

1955–Katie

Hurricane Katie began on October 14, 1955, in the Caribbean Sea. It crossed into Hispaniola on the evening of October 16, and grew to have winds of 185 km/h (100 knots). Katie remained well out at sea for its duration in Canadian waters from October 17th to October 20th, and had no effects on Canada.

1956 – MAP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1956
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#7 Flossy
Sep 26, 1956
00 UTC
35 kts
#3 Betsy
Aug 17, 1956
12 UTC
70 kts
#4 Carla
Sep 10, 1956
12 UTC
35 kts

1956–Betsy

Hurricane Betsy, the strongest hurricane of the season, developed east of the Lesser Antilles on August 9, 1955. Maximum winds obtained were 195 km/h (105 knots). Betsy was heading in a northeast direction when it entered the CHC Response Zone as a 130 km/h (70-knot) hurricane on August 17th, remaining at marginal hurricane strength as it moved into Canadian waters before midnight. Betsy then turned to the east about 300 km (180 mi) south of Nova Scotia. Only the Canadian waters were affected by this storm and it left the CHC Response Zone's southeastern corner on August 20th.

NEWFOUNDLAND

August 17, 1956

- *$30,000* ship sank off the Grand Banks, all crewmen survived (Newfoundland Grand Banks Genealogical & Historical Data)

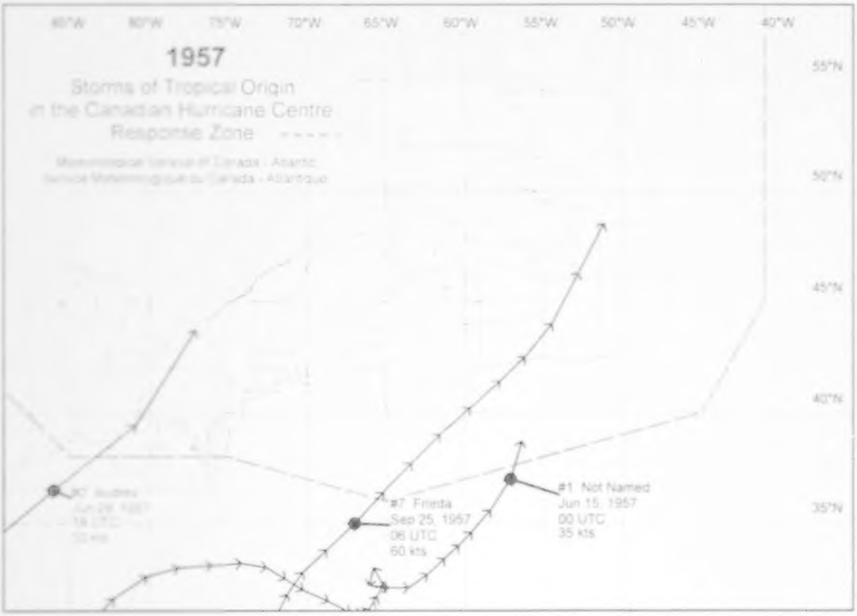
1956–Carla

Tropical Storm Carla formed north of eastern Cuba on September 5, 1955 and remained at sea during its lifetime, which spanned from September 5th to September 12th. The winds from Carla gusted up to 83 km/h (45 knots) and this storm tracked northeast over the southeastern section of the CHC Response Zone. Carla had taken on extratropical characteristics by the afternoon of September 10th but was still at tropical depression strength as it moved through the Grand Banks waters that night. Carla left the CHC Response Zone shortly on September 12th, and did not have any impact on Canada.

1956–Flossie

Hurricane Flossie formed in a disturbance that moved across Guatemala from the Pacific on September 21, 1955. It seems to have reached maximum intensity at Burrwood with a highest wind of 148 km/h (80 knots). Flossie's path took it over the inland sections of the eastern United States before the storm re-entered the Atlantic and the CHC Response Zone, in an easterly direction on September 28th. Flossy lessened to a low pressure system that moved over Newfoundland with no damaged produced. Flossy left the CHC Response Zone near Greenland late on September 30th.

1957 – MAP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1957
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Audrey
Jun 28, 1957
18 UTC
#7 Frieda
Sep 25, 1957
06 UTC
60 kts
#1 Not Named
Jun 15, 1957
00 UTC
35 kts

1957–NN-1

NN-1 formed in the center of the Gulf of Mexico on June 8, 1957. NN-1 only developed into a tropical storm as it winds only reached 111 km/h (60 knots). The storm entered the CHC Response Zone on June 15th while weakening and diminishing the same day.

1957–Audrey † (15 Canadian fatalities)

Audrey made landfall over Ontario as a tropical storm with winds of 93 km/h (50 knots) in the early morning hours of June 29th.

Audrey originated in the Gulf of Mexico between the Yucatan Peninsula and the Mexico mainland on June 25, 1957. At Audrey's maximum strength, it was a category four hurricane with winds of 230 km/h (125 knots). Audrey entered the CHC Response Zone as a tropical depression on June 28th and strengthened to a tropical storm inside the CHC

Response Zone. Audrey entered Ontario, through Lake Ontario, just after midnight on July 29th, with winds of 93 km/h (50 knots). **In Ontario, one boy was drowned in raging water in Toronto and another two adults were killed when their car hydroplaned. Five people died in Ontario. Ten people were killed in Montreal. Nine of the ten were killed in car accidents caused by the storm.** There were also two people injured in the storm. Hurricane Audrey diminished on June 29th.

ONTARIO

June 29, 1957

- A two year old boy drown in raging waters in the Toronto area (TS)
- Two other deaths occurred when a man and his wife were in their car that collided with another car caused by hydroplaning (TS)
- Rainwater carried sand across streetcar tracks and derailed two cars (TS)

July 2, 1957

- A man died in a car accident caused by poor road conditions in Northport (TS)
- Five deaths total from storm in Ontario (TS)
- A firefighter and another car occupant round out the five deaths (TS)
- Two injured people from storm (TS)
- 65 cottagers were isolated in a park because of washed out roads (TS)
- 24 washouts on the Ontario Northland Railway and 20 families had to be evacuated in North Bay (TS)

July 4, 1957

- Estimates were made that it cost Metro *$25,000* everyday rainfall is heavy (TS)

July 5, 1957

- Six people were stranded for four nights in Algonquin Park because of swollen rivers and down trees on roads (TS)

QUEBEC

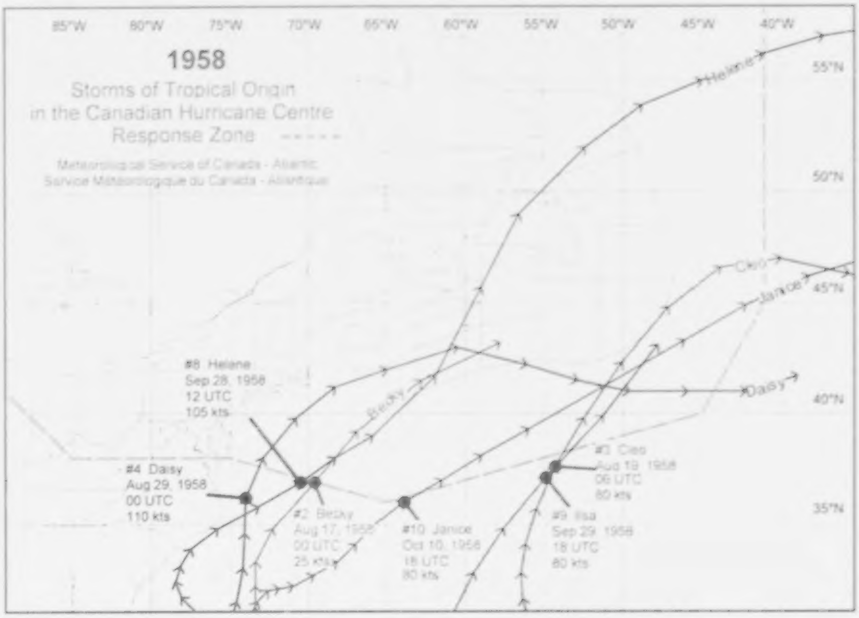
July 1, 1957

- 10 died in the Montreal district, nine of them in traffic mishaps (MG)
- More than *$3,000* worth of damage was done to boats in Magog (MG)
- This storm was the worst in 20 years (MG)
- Power in the Saraguay region was out for days and this area suffered the worst of the power damage in the province (MG)
- At least 100 properties were damaged by water (MG)

1957–Frieda

Hurricane Frieda originated over Bermuda on September 20, 1957. Frieda developed into a category one hurricane, and carried winds as high as 129 km/h (70 knots). It entered the CHC Response Zone on September 25th, moved into southeastern Canadian waters as a tropical storm of 102 km/h (55 knots) on the afternoon of September 26th, and passed just east of the Avalon Peninsula of Newfoundland early on the morning of September 27th. No damage information was located for this storm.

1958 – MAP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1958
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Helene
Cleo
Janice
Daisy
Becky
#8 Helene
Sep 28, 1958
12 UTC
105 kts
#4 Daisy
Aug 29, 1958
00 UTC
110 kts
#2 Becky
Aug 17, 1958
00 UTC
25 kts
#10 Janice
Oct 10, 1958
18 UTC
80 kts
#3 Cleo
Aug 19, 1958
06 UTC
80 kts
#9 Ilsa
Sep 29, 1958
18 UTC
80 kts

1958–Becky

Tropical Storm Becky began in the Cape Verde Islands on August 8, 1958. Becky carried winds of 92 km/h (50 knots) at its maximum strength. It entered the CHC Response Zone, moved into southern Maritime waters, and then dissipated, all on August 17th. No Canadian damage information was located.

1958–Cleo

Developing on August 11, 1958 Cleo originated as a Cape Verde storm and grew to a category five hurricane with winds of 260 km/h (140 knots). It entered the CHC Response Zone on August 19th as a category one hurricane, clipped the extreme eastern Grand Banks waters, and left the CHC Response Zone on August 20th. Hurricane Cleo remained at sea throughout its life span and there were no reports of any severe damage.

NEWFOUNDLAND

August 29, 1958

- 50 mm (2 in) of rain fell in St. John's (ET)
- The hurricane was moving in a northerly direction but veered east and was only felt in the extreme southern region of the Grand Banks (ET)
- No damages were reported (ET)

1958–Daisy

Daisy formed in the Gulf of Mexico on August 24, 1958 and reached category three strength with 205 km/h (110 knots) winds. Hurricane Daisy entered the CHC Response Zone on August 29th and was at its maximum strength. Daisy weakened to a strong category two hurricane prior to entering Canadian waters in the late afternoon of August 29th and continued weakening as she moved eastward. One boat was damaged in the storm however the crew was safe. The storm passed outside of the CHC Response Zone on August 31st and ended the same day.

NOVA SCOTIA

August 30, 1958

- Oblong shaped storm centre made it 'unique' (HH)

September 2, 1958

- A Digby fisherman's boat had the shaft on the trawler break and then tried to set his sail to only have it broken by the winds of the storm (TJ)
- He drifted for two days across the Bay of Fundy to Saint John unscathed (TJ)

1958–Helene

On September 29, 1958, Helene passed over central Newfoundland during the afternoon with category one hurricane winds of 120 km/h (65 knots).

Helene formed east of the Lesser Antilles on September 21, 1958. It developed into a category four hurricane with winds as high as 213 km/h (115 knot). Helene entered the

CHC Response Zone on September 28th as a category three hurricane. Helene was at 158 km/h (85 knots) as it entered Canadian waters shortly after midnight on the 29th and had weakened further to a 120 km/h (65-knot) hurricane as it made landfall in Newfoundland later that afternoon. It brought high winds to the Maritimes that uprooted trees and knocked down telephone lines. It also smashed windows and buckled homes. Helene left the CHC Response Zone on September 30th and diminished on October 4th.

NOVA SCOTIA

September 29, 1958

- More than 25 mm (1 in) of rain fell in southern parts of the Maritimes (HH)
- Expected to 'sidestep' Nova Scotia (HH)

September 30, 1958

- Winds more than 80 km/h (44 knots) and the storm moved at 95 km/h (52 knots) across the Cabot Strait (HH)
- 'slammed unexpectedly into Nova Scotia', especially Cape Breton (HH)
- Immobilized Sydney; trees tumbled across main streets, store windows smashed, demolished cars, buckling homes, and even moving one house off its foundation (HH)
- Estimated damage costs for Sydney alone: *$100,000* (HH)
- 500 to 700 people went without power for over 24 hours in Sydney (HH)
- Worst storm for Cape Breton since 1936 or 1937 and possibly even the hurricane in 1927 that had 160 km/h (87 knots) winds (HH)
- Only one telephone line was left as a source of communication from Cape Breton to the mainland (HH)
- Several large trees were uprooted and blown down in Halifax/Dartmouth (HH)
- A 35 m (114 ft) boat was run aground on Scatarie Island (ET)

NEWFOUNDLAND

September 30, 1958

- Bell Island was cut off from the rest of the island because of damaged piers and no boat service (ET)
- 70 foreign and local ships sought refuge in St. John's harbour (ET)
- The United States navy station at Argentia had winds of 100 km/h (55 knots) with gust to 132 km/h (71 knots) (HH)
- Numerous reports of property damage and minor damage, but no serious damage, injuries or loss of life (ET)

- Estimated costs for Newfoundland damage was ***hundreds of thousands of dollars*** (ET)

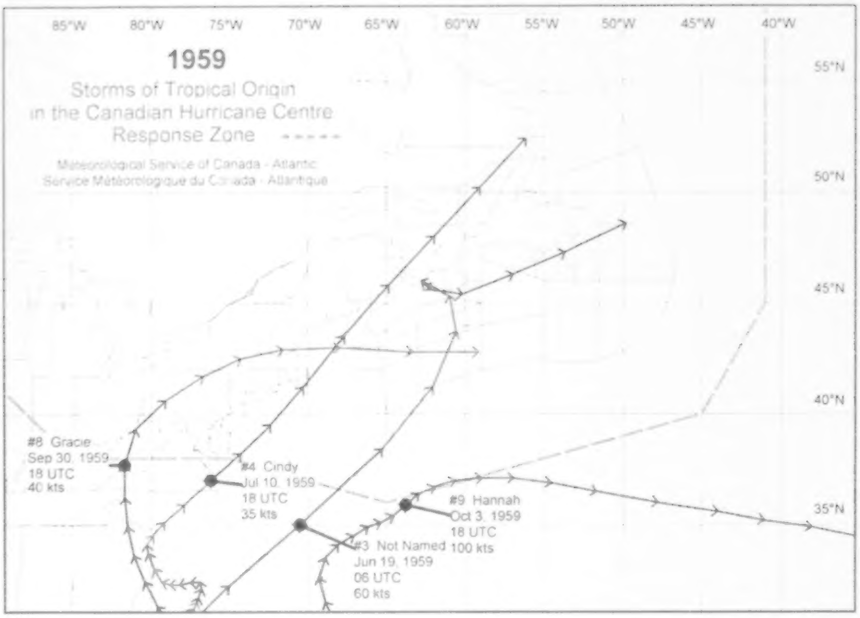
1958–Ilsa

Ilsa originated east of the Lesser Antilles on September 24, 1958. It developed into a category four storm carrying winds of 213 km/h (115 knots). It passed into the CHC Response Zone on September 29th and dissipated on September 30th. Canada was not impacted by this storm.

1958–Janice

Janice formed over the Cayman Islands on October 5, 1958. Janice became a category one hurricane and brought winds of 148 km/h (80 knots). It entered the CHC Response Zone on October 10th and dissipated on October 13th. Janice did not damage Canadian territory.

1959 – MAP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1959
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone -----
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#8 Gracie Sep 30, 1959 18 UTC 40 kts
#4 Cindy Jul 10, 1959 18 UTC 35 kts
#9 Hannah Oct 3, 1959 18 UTC 100 kts
#3 Not Named Jun 19, 1959 06 UTC 60 kts

1959–NN-1 ("The Escuminac Disaster") † (35 Canadian fatalities)

On June 20th, NN-1 made landfall as a category one hurricane at Canso, Nova Scotia and moved over the Northumberland Strait. Winds of 130 km/h (70 knots) were felt upon its arrival. The storm also made landfall in Prince Edward Island as a tropical storm with winds of 111 km/h (60 knots) later that day. NN-1 finally made landfall over Newfoundland as a tropical storm with winds of 84 km/h (45 knots) on June 21st.

Hurricane NN-1 developed west of Florida in the Gulf of Mexico. It began on June 18, 1959 and strengthened into a category one hurricane. At this point NN-1 entered the CHC Response Zone with winds of 129 km/h (70 knots). **NN-1 claimed the lives of 35 men, most of these fishermen from Prince Edward Island and New Brunswick.** Fishing gear was badly destroyed, boats were lost, and damage to personal property occurred. Hurricane NN-1 diminished on June 19th.

- The storm was reported to be accompanied by the highest tide since 1940 (HH)
- 120 km/h winds (65 knots) (CDD)

- 22 fishing boats were lost (CDD)
- Escuminac Memorial Website: **http://cap.ic.gc.ca/nb/hardwicke/attractions/monument.htm**

NEW BRUNSWICK

June 22, 1959

- Royal Canadian Mounted Police (RCMP) reported that two bodies were washed upon the shore near Richibucto (G)
- 12 people reported dead (G)
- Five of the known dead who were recovered were from Baie Sainte Anne (G)
- Two of the known dead were recovered from Bay du Vin (G)
- The captain of fishing vessel is presumed dead after his boat capsized. The two other crewmembers were rescued (TJ)
- Winds of 120 km/h (65 knots) were felt throughout the province (G)
- In Shediac, 40 mm (1.5 in) of rain fell in a 24 hour period (HH)
- 15 m (49 ft) waves were reported (G)
- Heavy seas washed over the protective basin formed by a wharf and breakwater at Point du Chene and resulted in the sinking several fishing boats tied to the wharf. Many other boats in other harbours around the province have also been battered (G)
- Search and Rescue reported that 22 derelicts were found between Point Escuminac and Richibucto (G)
- Hulks were washed ashore and others were sunken in shallow water (G)
- Point du Chene had damage to cottages and pleasure boats. In addition, many lobster pots on the wharf were damages (HH)
- Fishing boats lost were about *$2,200* in value and a salmon net cost *$1,500*. Most fishermen caught in the storm lost their nets. In addition, more then 12,000 lobster pots lost valued at *$60,000* (HH)
- Communications between areas was disrupted and delayed (HH)

June 23, 1959

- 35 people were officially listed as dead Monday night (G)
- Destroyed about a third of the Miramichi area Salmon Fleet (TJ)
- About 45 boats were reported in the strait when the gale began (TJ)

June 24, 1959

- 11 bodies have been recovered of the 35 dead (HH)
- 22 boats are missing and accounted as wrecked (HH)

NOVA SCOTIA

June 22, 1959

- One fishing boat was reported smashed at Kempt's Point. Others, where thrown upon the beach and damaged (HH)
- Richmond Coast had loss of telephone communication and L'Ardoise was the nearest available communication point (HH)

June 24, 1959

- The coast in Cape Breton was dotted with wreckage of boats and lobster pots that were torn from their moorings (TJ)
- Storm cost Cape Breton fishermen *thousands of dollars* (TJ)
- In Petit de Grat, eight fishermen who shared a *$15,000* fishing net had it completely destroyed. Also, a salmon net and a gill net were destroyed valued at *$1,500* and *$200* each (TJ)
- In Gabarouse, lobster traps were damaged and many small crafts were battered and sunk (TJ)
- Four boats out of Capelin Cove were reported wrecked (TJ)
- The storm smashed fishing boats, lobster traps and fishing nets along the coast of Cape Breton (TJ)

PRINCE EDWARD ISLAND

June 22, 1959

- A Prince County fisherman was presumed dead and another injured as the storm passed by (G)
- Summerside reported 72 km/h (39 knots) winds gusting to 105 km/h (57 knots) at 4:00 am ADT on Saturday, June 20th (TJ)
- Sea Cow Pond, 5 km (3 mi) from the northern tip of Prince Edward Island was a picture of disaster and destruction (G)
- Broken ribs of a boat at Sea Cow Pond were all that remain of a ship that was wrecked. In addition, motors were torn away from the boat and buried in sand (G)
- There were large losses to fishermen. 5,000 traps were lost in Souris to the Launching Place area. There were similar loses to Murray Harbour and Alberton areas (HH)
- Five vessels were destroyed at Alberton and one badly damaged at Sea Cow Pond (HH)
- Extensive damage to fishing gear extended from North Cape to Wood Islands (G)
- Estimates of *$750,000* of damage (G)
- Four boats where ashore and wrecked at Sea Cow Pond (HH)

June 23, 1959

- Amandale and Launching fishermen received heavy losses (G)
- Sturgeon and Gaspereaux area fishermen lost less as their gear was in deeper water (G)
- No boats were lost between Tracadie and Tustic, however the gear had more damage near Rustico (G)
- One *$4,000* trap was lost off Herring Cove near Fortune and owned by the provincial government (G)
- 25–50% of the inshore traps were either missing or destroyed (G)

1959–Cindy

Cindy made landfall over New Brunswick as a tropical storm with winds of 93 km/h (50 knots) on July 11th. Cindy also made landfall over Prince Edward Island as a tropical storm with winds of 84 km/h (45 knots) on July 12th. Cindy finally made landfall over Quebec and Labrador as a tropical storm with winds of 65 km/h (35 knots) on July 12th.

Hurricane Cindy originated off the upper east coast of Florida, on July 5, 1959. Developing into a category one hurricane, its winds reached 120 km/h (65 knots). Entering the CHC Response Zone on July 11th Cindy had weakened to a tropical storm with winds of 92 km/h (50 knots) and dissipated on July 12th. Hurricane Cindy caused heavy rain and high winds in Nova Scotia, and heavy rain in New Brunswick. One boat was lost in Nova Scotia.

NOVA SCOTIA

July 13, 1959

- Hurricane Cindy caused high winds and heavy rains along the coast and in southern Nova Scotia (HH)
- Small boats took shelter (HH)
- There was no damage reported (HH)
- The ship *Lady Godiva* sank in North West Arm, Halifax. The two crewmembers were rescued (HH)

NEW BRUNSWICK

July 13, 1959

- Rain measured as high as 50 mm (2 in) in the province (HH)

1959–Gracie

Hurricane Gracie formed northeast of the Bahamas on September 20, 1959 and became a category four hurricane. Gracie brought winds reaching 222 km/h (120 knots), however it entered the CHC Response Zone as a tropical storm on September 30th and weakened to a tropical depression before passing south of eastern Canada. Tropical Depression Gracie brought heavy rains to the province of Nova Scotia and damaged unpaved roads and caused flooding.

NOVA SCOTIA

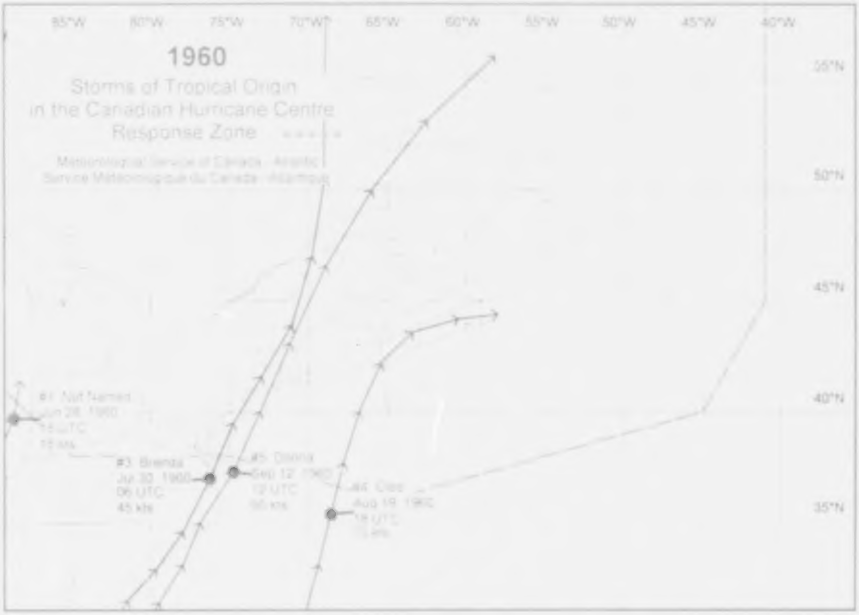
October 3, 1959

- Yarmouth received 170 mm (6.8 in) of rain (HH)
- Liverpool reported 105 mm (4.1 in) of rain, Halifax had 35 mm (1.3 in), Ecum Secum had 27 mm (1.1 in) and Greenwood had 27 mm (1.1 in). Northern Nova Scotia, Eastern Shore, and Cape Breton all reported less than 25 mm (1 in) of rain (HH)
- Several manhole covers were forced from the roads due to the water pressure in the sewer pipes (HH)
- Hundreds of cellars were flooded and needed help from the fire department (HH)
- Many of the unpaved roads were badly damaged and needed repairs (HH)
- There was no loss of life (HH)

1959–Hannah

Hurricane Hannah developed on September 26, 1959 in the mid-Atlantic, east-southeast of Bermuda. Turning into a category two hurricane, Hannah carried winds of 200 km/h (108 knots) at it strongest point and winds of 176 km/h (95 knots) when it entered the CHC Response Zone on October 4th. Hurricane Hannah spent its entire life span over the ocean, and dissipated on October 8th without having impacted Canada.

1960 – MAP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45°W
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40°N
35°N
1960
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#1 Not Named
Jun 28 1960
18 UTC
15 kts
#3 Brenda
Jul 30 1960
06 UTC
45 kts
#5 Donna
Sep 12 1960
12 UTC
95 kts
#4 Cleo
Aug 19 1960
18 UTC

1960–NN-1

NN-1 began on June 22, 1960 in the Gulf of Mexico. The storm only reached tropical status, containing winds as high as 74 km/h (40 knots). NN-1 was weakening significantly as it entered the CHC Response Zone on June 29th. At that point it was downgraded to a tropical depression, containing winds as high as 27 km/h (15 knots). The storm dissipated that same day and did not result in any damage reported in Canada.

1960–Brenda

Brenda made landfall over Quebec as a tropical storm with winds of 74 km/h (40 knots) on July 31st.

Brenda formed in the northeast section of the Gulf of Mexico on July 28, 1960. Brenda only reached tropical storm status bringing winds of 92 km/h (50 knots). It entered the

CHC Response Zone on July 30th and entered Canada through Quebec near dawn on July 31st, at a strength of 74 km/h (40 knots). Brenda dissipated on August 1st without impacting Canada.

1960–Cleo

Cleo originated near the Bahamas on August 17, 1960. Cleo developed into a category one hurricane and entered the CHC Canadian waters near dawn on August 20th with strong category one winds of 148 km/h (80 knots). Cleo dissipated on August 21st and did not cause any reported damage in Canada or her waters.

1960–Donna † (1 Canadian fatality)

Donna made landfall over New Brunswick and Quebec as a tropical storm with winds of 111 km/h (60 knots) on September 13th. Donna also made landfall over Labrador as a tropical storm with winds of 102 km/h (55 knots) on September 13th.

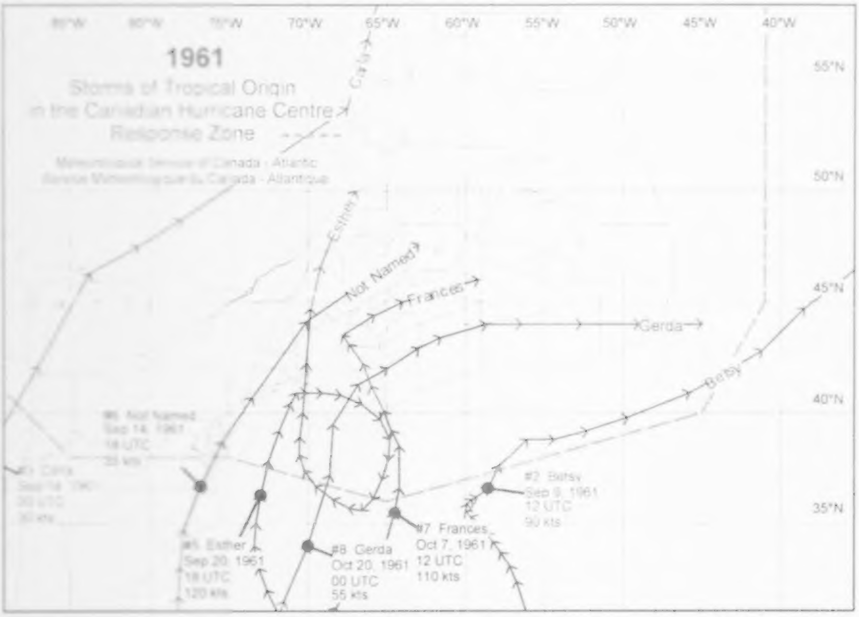
Developing on August 29, 1960, Donna originated in the Cape Verde Islands and grew to a category five hurricane with winds of 260 km/h (140 knots). It entered the CHC Response Zone on September 12th as a category two hurricane and carried winds reaching 176 km/h (95 knots) to the area. Donna weakened to tropical storm strength winds of 111 km/h (60 knots) by the time it moved into New Brunswick in the early morning hours of September 13th. **One man died during the storm** and two people were injured. It gradually weakened as it moved northeast. At that point it was only considered a weakening frontal disturbance and dissipated on September 14th.

QUEBEC

August 30, 1960

- One man died from a heart attack when flames from a fire caused by the heavy winds, threatened his home (MG)
- 85 km/h (46 knots) winds snapped power poles and trees (MG)
- Two people were injured in weather-related traffic accidents (MG)

1961 – MAP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50°N
45°N
40°N
35°N
1961
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Carla
Esther
Not Named
Frances
Gerda
Betsy
#6 Not Named
Sep 14, 1961
18 UTC
35 kts
#3 Carla
Sep 14, 1961
00 UTC
30 kts
#5 Esther
Sep 20, 1961
18 UTC
120 kts
#8 Gerda
Oct 20, 1961
00 UTC
55 kts
#7 Frances
Oct 7, 1961
12 UTC
110 kts
#2 Betsy
Sep 9, 1961
12 UTC
90 kts

1961–Betsy

Betsy originated southeast of the Lesser Antilles on September 2, 1961. It reached category four hurricane status with winds of 220 km/h (120 knots). Once Betsy entered the CHC Response Zone on September 9th, it veered east away from land. Betsy entered the CHC Response Zone as a category two hurricane and carried winds of 166 km/h (90 knots). As it moved east, Betsy did not cause any damage. The storm left the CHC Response Zone on September 11th and diminished on September 12th.

NOVA SCOTIA

September 11, 1961

- Betsy only incurred winds of 48 km/h (26 knots) and did not record any damage (HH)

1961–Carla

Carla made landfall over Ontario, Quebec and Labrador as a tropical depression with winds of 55 km/h (30 knots) on September 14-15th.

Hurricane Carla lived from September 3rd to September 16, 1961. Carla formed just north of Panama and became a category five hurricane with winds of 278 km/h (150 knots). Carla was a tropical depression with winds of 56 km/h (30 knots) upon entering Ontario on the morning of September 14th. Numerous power outages and fallen tress were reported as high winds swept through the eastern portion of the country.

ONTARIO

September 15, 1961

- Trees blew down on wires causing numerous power outages in the Clarkson-Port Credit area (TS)

NEW BRUNSWICK

September 16, 1961

- 130 km/h (70 knots) winds in Saint John (HH)
- Numerous power outages throughout the province (HH)

NOVA SCOTIA

September 16, 1961

- 92 km/h (50 knots) winds in Halifax (HH)
- The Public Gardens in Halifax had to close for fear of falling trees and branches (HH)

1961–Esther

Esther made landfall over New Brunswick and Quebec as a tropical depression with winds of 55 km/h (30 knots) on September 26th.

Esther began in the middle of the Atlantic Ocean west of the Cape Verde Islands on September 10, 1961. Esther grew to a category four hurricane with winds of 230 km/h (125 knots). Upon entering the CHC Response Zone on September 21st, Esther was still a category four hurricane. It then spent more than four days looping to the southwest of Canadian waters before tracking northward again. By this time, however, the storm had lost considerable strength and eventually entered Canada through northern Maine as a tropical depression, carrying winds of 55 km/h (30 knots). Esther did not result in any damage reported in Canada.

September 22, 1961

- Downgraded to a tropical storm and no damage was reported (HH, TJ)

1961–NN-1

NN-1 made landfall over New Brunswick as a tropical storm with winds of 64 km/h (35 knots) on September 15th.

Storm NN-1 was developed off the Bahamas on September 12, 1961. The storm only reached tropical storm status and did not develop into a hurricane. Its winds reached a maximum of 64 km/h (35 knots). NN-1 entered the CHC Response Zone on September 15th and tracked rapidly northeastward, entering New Brunswick in the late morning of the 15th and then into the Gulf of St. Lawrence that afternoon. The storm, which carried the full strength of its winds through inland and marine areas, dissipated the same day without impacting Canada.

1961–Frances

Frances made landfall over Nova Scotia as tropical storm with winds of 74 km/h (40 knots) on October 9th.

Hurricane Frances formed in the Lesser Antilles on September 30, 1961. It developed into a category three hurricane with winds up to 205 km/h (110 knots) at its maximum strength. Frances entered the CHC Response Zone on October 6th as a category two hurricane but strengthened into a category three hurricane of 185 km/h (100 knots) as it entered southwestern Maritime waters on the morning of the 8th. Frances weakened continually as it tracked northward over the next 30 hours, making landfall in western Nova Scotia as a much weakened tropical storm of 74 km/h (40 knots). There were no damage reports in the Maritimes. The storm dissipated on October 10th.

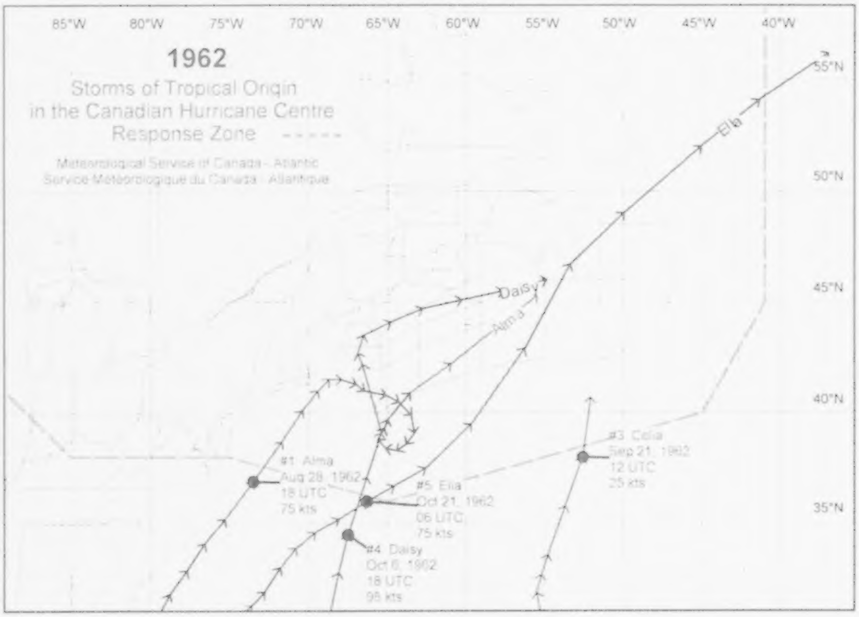
October 10, 1961

- This is the third storm in five weeks (Betsy and Esther were the first two) to miss the Maritimes and not produce any damage to apple crops or fisherman (HH, TJ)

1961–Gerda

Tropical Storm Gerda began over Jamaica on October 16, 1961. Gerda contained winds reaching 111 km/h (60 knots) at its maximum strength. Tropical Storm Gerda entered the Canadian waters on the afternoon of October 20th at its strongest. It survived there for two days before it diminished on October 22nd and did not cause any damage reported in Canada.

1962 – MAP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35°N
1962
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Ella
Daisy
Alma
#1 Alma
Aug 28, 1962
18 UTC
75 kts
#3 Celia
Sep 21, 1962
12 UTC
25 kts
#5 Ella
Oct 21, 1962
06 UTC
75 kts
#4 Daisy
Oct 6, 1962
18 UTC
95 kts

1962–Alma

Alma originated on August 26, 1962, east of the Florida coast. Maximum winds produced were 148 km/h (80 knots) making it a category two hurricane. Alma paralleled the United States east coast and entered the CHC Response Zone on August 29th. Alma's northeasterly path made a 'loop-du-loop' in the southern area of the CHC Response Zone and dissipated before reaching Newfoundland. It entered Canadian waters first on the morning of August 30th with maximum winds in Canadian waters being 83 km/h (45 knots). No effects were felt from Alma.

1962–Celia

Tropical Storm Celia began east of Barbados on September 12, 1962. Celia's track took her almost due north and over the open ocean away from any land, where she reached maximum winds of 111 km/h (60 knots). Celia entered the CHC Response Zone on the afternoon of September 21st and passed well east of Newfoundland. The storm later weakened and died in the CHC Response Zone early on September 22nd, having no impact on Canada.

1962–Daisy † (6 Canadian fatalities)

On October 8, 1962, Daisy made landfall near Yarmouth, Nova Scotia. Daisy was a category one hurricane with winds of 120 km/h (65 knots) when it hit land.

Hurricane Daisy made its beginnings as a large storm on September 29, 1962, east of Barbados. Winds reached 176 km/h (95 knots) as the storm moved due north but it weakened to a 130-km/h (70-knot) hurricane as it moved into Canadian waters near dawn on October 7th. The storm turned sharply eastward and veered east along the Nova Scotia shoreline on the night of October 7th. Winds gusted up to 137 km/h (74 knots) in parts of Nova Scotia and damage by the wind was done in Newfoundland and Nova Scotia. **Six people died in Nova Scotia.** Daisy passed south of Newfoundland and died shortly after on October 9th.

NOVA SCOTIA

October 8, 1962

- Six people swept into the water at Peggy's Cove and drowned (ET)
- Winds gusting to 137 km/h (74 knots) in the parts of the province (ET)
- *$16,000* of floating breakwater and three fishing boats were smashed by 4.5 m (15 ft) waves in Shelburne (ET)
- The government pier and building was lost at Sandy Point in Shelburne County (ET)
- Telephone service was disrupted in Yarmouth and Shelburne (ET)

October 9, 1962

- 30 mm (1.2 in) of rain fell in Sydney (HH)
- Two boats lost at Seal Point (HH)
- Lockeport lost two beaches as the sand washed across the highway (HH)

PRINCE EDWARD ISLAND

October 9, 1962

- Summerside had 113 km/h (60 knots) winds, gusting to 130 km/h (70 knots) (ET)

NEWFOUNDLAND

October 9, 1962

- 50 mm (2 in) of rain in central and eastern Newfoundland (ET)
- Two boats in New Harbour were torn from their moorings and drifted ashore (ET)
- Fishing boat crashed ashore at Seaforth, minimal damage (ET)

1962–Ella

Ella made landfall over Newfoundland as a tropical storm with winds of 111 km/h (60 knots) on October 22nd.

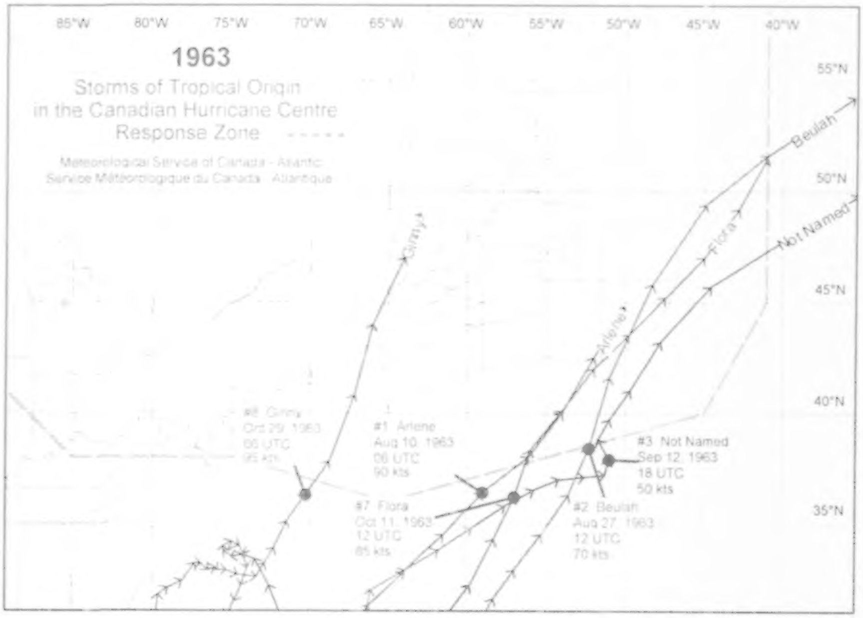
Ella was born east of the Bahamas on October 14, 1962. Ella tracked in a northeasterly direction from this origin and grew to give winds of 185 km/h (100 knots). Ella came into the CHC Response Zone on October 21st and moved into Canadian waters just after midnight on the 22nd, packing winds of 120 km/h (65 knots). Ella reached the Avalon Peninsula of Newfoundland later that morning but had been downgraded to a tropical storm of 111 km/h (60 knots) by the time it made landfall. No damage was reported in Newfoundland or the Maritimes from this storm as it left the CHC Response Zone on its northeasterly track, on the morning of October 23rd.

NEWFOUNDLAND

October 23, 1962

- No damage in Newfoundland (ET)

1963 – MAP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35°N
1963
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Beulah
Not Named
Flora
Ginny
Arlene
#8 Ginny
Oct 29 1963
06 UTC
95 kts
#1 Arlene
Aug 10 1963
06 UTC
90 kts
#3 Not Named
Sep 12 1963
18 UTC
50 kts
#7 Flora
Oct 11 1963
12 UTC
85 kts
#2 Beulah
Aug 27 1963
12 UTC
70 kts

1963–Arlène

Arlene was first detected as a tropical depression on July 31, 1963, in the mid-Atlantic, east of Guinea-Bissau. Hurricane Arlene maintained winds of 167 km/h (90 knots). During the night of August 10th through August 11th, it entered Canadian waters as a 148-km/h (80-knot) hurricane but quickly lost tropical characteristics and merged with a polar front some 320 km (200 mi) southeast of Cape Race, Newfoundland. Arlene quickly left the CHC Response Zone on the evening of August 11th and its effects were not felt by Canada.

1963–Beulah

Beulah was born on August 20, 1963, east of the Barbados. The maximum winds obtained were 195 km/h (105 knots) and this storm tracked northeast, well offshore of the United States. Beulah remained in the eastern most portion of the CHC Response Zone from August 27th to August 28th, tracking through the outer Grand Banks. Beulah had no reported effects on Canadian waters.

1963–NN-1

NN-1 developed off the northeast coast of Florida on September 10, 1963. This tropical storm sustained winds of 93 km/h (50 knots) and its track took it over the open Atlantic. NN-1 was located in the southeastern section of the CHC Response Zone from September 13th to September 14th. This storm did not affect Canada.

1963–Flora

Hurricane Flora was born on September 26, 1963, west of Guinea. This large hurricane gave maximum winds of 232 km/h (125 knots). Flora tracked in a popular northeast fashion, and ended up like many of the previous storms that year, in the southeastern section of the CHC Response Zone away from land. From October 11th to October 13th, Flora was in the Response Zone but proved to have had no impacts. It moved quickly through the Grand Banks on October 12th as a category one hurricane with winds of 139 km/h (75 knots).

NEWFOUNDLAND

October 14, 1963

- No damage in Newfoundland (HH)

1963–Ginny

Ginny's path took it almost due north making landfall at Yarmouth, Nova Scotia. This category two hurricane packed winds of 176 km/h (95 knots) when it hit on October 29th. Ginny then passed over Moncton, New Brunswick and finally over northern Prince Edward Island, with category two hurricane winds of 166 km/h (90

knots). There would not be another category two hurricane to make landfall in Nova Scotia for forty years . . . until Juan arrived in 2003.

Ginny formed near the Bahamas on October 16, 1963. Ginny became stronger upon entering the CHC Response Zone on October 29th, with winds of 167 km/h (90 knots), growing to winds of 176 km/h (95 knots) as it entered Canadian waters in the morning and then made landfall near Yarmouth, Nova Scotia, in the afternoon. Winds of 160 km/h were reported in Greenwood, Nova Scotia, and damage throughout the Maritimes was extensive. *Millions of dollars* worth of damage was done by the wind, rain and snow, but luckily, there were no fatalities. Ginny dissipated over Northern Quebec on October 31st.

October 30, 1963

- Many small buildings were knocked over by the high winds across the Maritimes (G)

NOVA SCOTIA

October 30, 1963

- Gusts of wind in Truro reached 105 km/h (57 knots), with sustained winds of 61 km/h (33 knots) (HH)
- Truro had 55 mm (2.1 in) of rain in 24 hours (HH)
- Trees blew over in Halifax (HH)
- Moorings broke from boats, forced many boats out to sea in Halifax (HH)
- Power outages in Halifax and on the Macdonald Bridge caused massive traffic problems since the automatic tollgates would not work (HH)
- Telephone lines were down in Shelburne and Liverpool (HH)
- Power outages in Antigonish (HH)
- A power pole caught fire in Port Williams (HH)
- A piece of glass blew off the roof of a building at the corner of Barrington and Buckingham Street and landed on a car, which was badly damaged (HH)
- Sackville River Bridge on Shore Road was closed in Halifax County (HH)
- Two walls of a shopping centre under construction blew down in Dartmouth (HH)
- Short circuits set off air raid sirens in some sections of Halifax and Dartmouth (HH)
- Fire levelled all the farm buildings and a home in Amherst at the height of the storm. Damage estimated to be *$50,000* (HH)
- Main Street in Digby was flooded (HH)
- Several chimney fires in Digby and Antigonish (HH)
- A tree fell down on a car at Old Bams (HH)
- Halifax-Dartmouth ferry service stopped (TJ)

- The *Bluenose* ferry stayed in Bar Harbour, Maine to wait out the storm instead of travelling back to Yarmouth (TJ)
- In Lunenburg, some wharfs suffered damage (HH)
- Several motor boats and a yacht broke their moorings and went ashore in Lunenburg (HH)
- 20 Spanish trawlers went to into Halifax harbour for shelter (ET)
- Freighter lost its mooring and was grounded on rocks near Halifax (ET)

October 31, 1963

- 160 km/h (87 knots) winds at Greenwood (TJ)
- Washed an art studio across the road at Peggy's Cove (HH)
- Three fishing boats lost in Shelburne (HH)
- Lost lobster traps in the Bay of Fundy (HH)

NEW BRUNSWICK

October 30, 1963

- 85 mm (3.4 in) of rain and 139 km/h (75 knots) winds in Saint John (TJ)
- Power outages and loss of telephone service across New Brunswick, including Saint John and Fredericton (TJ)
- Reversing Falls Bridge in Saint John began to sway in heavy gusts (HH)
- Two people were taking to hospital after accidents related to the storm in Fredericton (TJ)
- Some classes cancelled and several bridges damaged in Kent County (TJ)
- Many wharfs in the Northumberland Strait were submerged (TJ)
- In Chatham, a freighter was blown from anchorage to the shore (TJ)
- All planes were grounded at the Saint John Airport (TJ)
- At least 50 chimneys blew down in the Saint John area (TJ)
- Roof fell in on a family of 11 in Saint John, no major injuries (TJ)
- Boy injured foot in the storm and taken to hospital in Saint John (TJ)
- Trees were uprooted, a church lost its steeple and houses were damaged (TJ)
- The ferry service between Digby and Saint John was also cancelled (TJ)

October 31, 1963

- 30 cm (12 in) of snow fell from Woodstock to Campbellton (TJ)

PRINCE EDWARD ISLAND

October 30, 1963

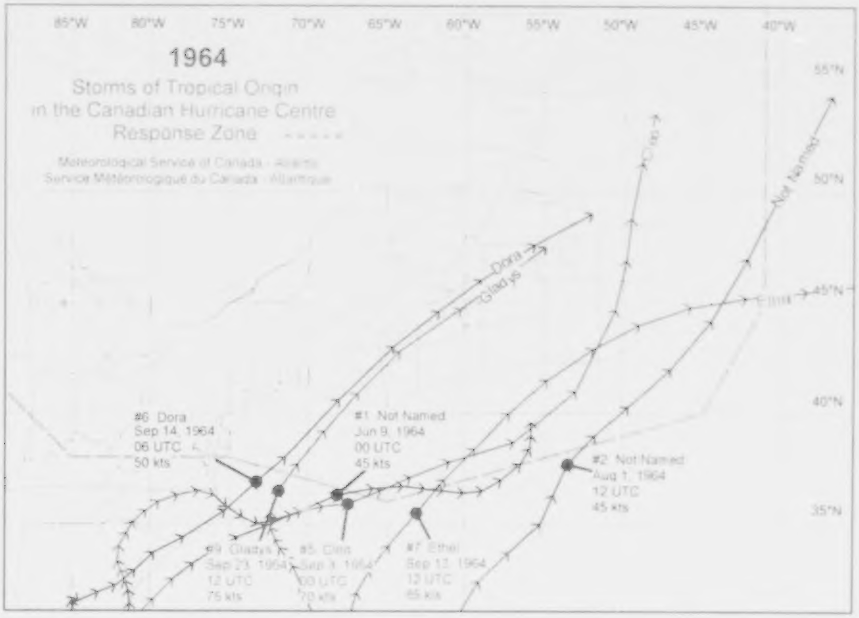
- Power outages across the island (G)
- Ferry service between Prince Edward Island and Nova Scotia was also halted (TJ)
- Man slipped on wet surface at the Confederation Memorial Site and fell 4.3 m (14 ft), he did not have serious injuries (G)

NEWFOUNDLAND

October 30, 1963

- 18 boats went to St. John's harbour for shelter from Ginny (ET)
- The ferry *Romeo and Juliet* in Newfoundland stopped running (TJ)

1964 – MAP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35°N
1964
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Cleo
Not Named
Dora
Gladys
Ethel
#6 Dora
Sep 14, 1964
06 UTC
50 kts
#1 Not Named
Jun 9, 1964
00 UTC
45 kts
#2 Not Named
Aug 1, 1964
12 UTC
45 kts
#9 Gladys
Sep 23, 1964
12 UTC
75 kts
#5 Cleo
Sep 3, 1964
00 UTC
70 kts
#7 Ethel
Sep 13, 1964
12 UTC
65 kts

1964–NN-1

NN-1 initiated south of Cuba on June 2, 1964. This tropical storm attained maximum winds of 93 km/h (50 knots). NN-1 had made landfall over the southeastern United States and re-entered the water moving in an east-northeasterly direction. The storm entered the CHC Response Zone on June 10th, passed over central Newfoundland, and continued heading north. By this point, the storm had substantially subsided and caused no damage to Canada.

1964–NN-2

Tropical Storm NN-2 began on July 28, 1964, west of the Cape Verde Islands. Maximum winds were 83 km/h (45 knots) and this storm tracked northeast well offshore of any Atlantic land. In the southeastern most section of the CHC Response Zone, the storm entered and exited from August 1st to August 3rd. No effects from the storm were felt in Canada.

1964–Cleo

Cleo formed east of Barbados on August 20, 1964. Hurricane Cleo became a category four hurricane with sustained winds of 250 km/h (135 knots). The storm attained hurricane intensity at sea and remained at hurricane strength with 139-km/h (75-knot) winds as it entered Canadian waters before dawn on September 4th. As it passed east of Newfoundland on September 4th, it lost its tropical features. Some injuries to people were reported in Newfoundland. The storm weakened over the cold waters and left the northern section of the CHC Response Zone on the morning of September 8th.

NEWFOUNDLAND

September 9, 1964

- Liner passed through Cleo damaging crockery and furniture. 13 people were treated for cuts and bruises and one man was taken to the hospital for a head injury (ET)
- Elderly lady injured onboard an ore carrier that passed through Cleo (ET)

1964–Dora

Dora made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on September 15th.

Dora originated on August 28, 1964 near the Cape Verde area. By September 1st, Dora had developed into a tropical storm with a central pressure of 998 mb (29.5 in). With winds of up to 213 km/h (115 knots), this category four hurricane tracked northeast and paralleled Nova Scotia very closely. Dora weakened to 102 km/h (55 knots) prior to entering Canadian waters on the afternoon of September 14th and remained at that strength as it moved into Newfoundland the following afternoon. Dora meandered north over the coast of Labrador and dissipated to a cold low pressure system. Boats were driven to shelter from the storm in Newfoundland.

NEWFOUNDLAND

September 16, 1964

- Heavy rains and winds of 95 km/h (52 knots) in central Newfoundland (ET)
- Over 100 ships came to the St. John's harbour for shelter from Dora (ET)

1964–Ethel

The first evidence of the beginning stages of Ethel was a cloud mass observed west of the Cape Verde Islands on September 4, 1964. Ethel tracked offshore of the United States eastern seaboard carrying winds of 185 km/h (100 knots) at its greatest strength. During Ethel's lifetime in the CHC Response Zone from September 13th to September 16th, the storm remained south of Nova Scotia and Newfoundland. Ethel's strongest winds in Canadian waters were 139 km/h (75 knots) on September 14th. Some flooding occurred in Nova Scotia, but no other impacts were felt.

NOVA SCOTIA

- Widespread flooding in Nova Scotia (CDD)

1964–Gladys

Gladys made landfall over Newfoundland as a tropical storm with winds of 111 km/h (60 knots) on September 24th.

A weak, low pressure system that was first observed off the west coast of Africa on September 9, 1964, may have been the first indication of the disturbance that later developed into Hurricane Gladys on September 13th. Gladys reached winds of 232 km/h (125 knots) and tracked in a northeasterly direction. Gladys entered Canadian waters shortly after midnight on September 24th as a marginal category one hurricane and weakened to just below hurricane strength by the time it made landfall in Newfoundland later that evening. Some ships were affected by the storm in Newfoundland, but no other damage was reported. Gladys eventually departed the CHC Response Zone east of Newfoundland early on September 25th.

NEWFOUNDLAND

September 25, 1964

- 65 ships took shelter in St. John's harbour (ET)

September 29, 1964

- Two foreign freighters damaged (ET)

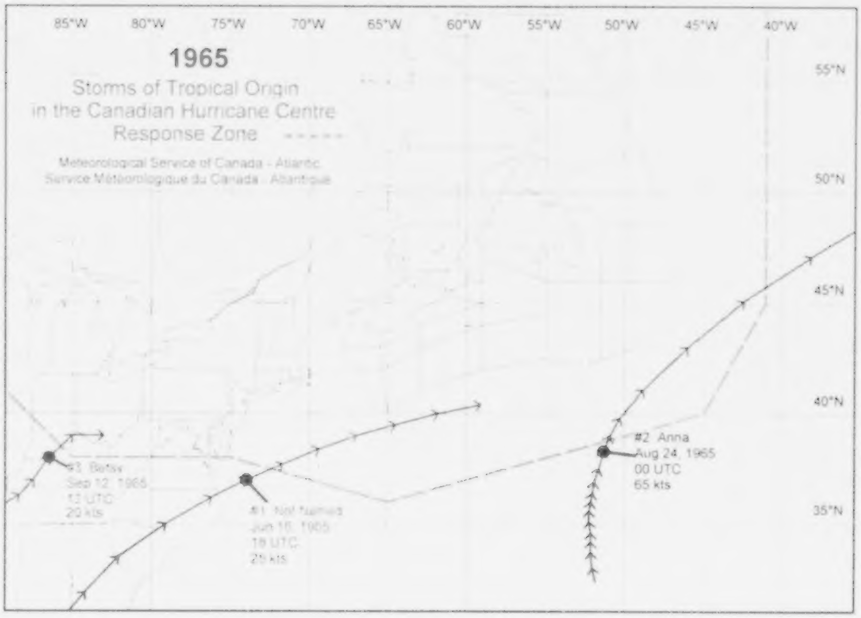
1964–Hilda

Hurricane Hilda began near Cuba on September 28, 1964. Hilda had maximum winds of 232 km/h (125 knots). Hilda barely crept into the southern edge of the CHC Response Zone and dissipated there. Hilda had no effects on Canada or to its waters.

1964–Isabell

Isabell originated on October 8, 1964 in the Caribbean Sea. As a category three hurricane, winds were measured at 204 km/h (110 knots) at the storm's peak. Isabell weakened considerably as it tracked to the northeast, and made landfall over Saint John, New Brunswick as a low pressure system. Isabell later died over Labrador and no damages were reported from this storm.

1965 – MAP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1965
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
55°N
50°N
45°N
40°N
35°N
#3 Betsy
Sep 12, 1965
12 UTC
20 kts
#1 Not Named
Jun 16, 1965
18 UTC
25 kts
#2 Anna
Aug 24, 1965
00 UTC
65 kts

1965–NN-1

NN-1 formed in the Gulf of Mexico on June 11, 1965 and only developed into a tropical storm. Its winds reached a maximum speed of 83 km/h (45 knots). NN-1 entered the CHC Response Zone on June 16th as it was weakening into a tropical depression. Within the CHC Response Zone, it brought winds of 56 km/h (30 knots). The storm left the CHC Response Zone on June 20th and dissipated the same day, without impacting Canada.

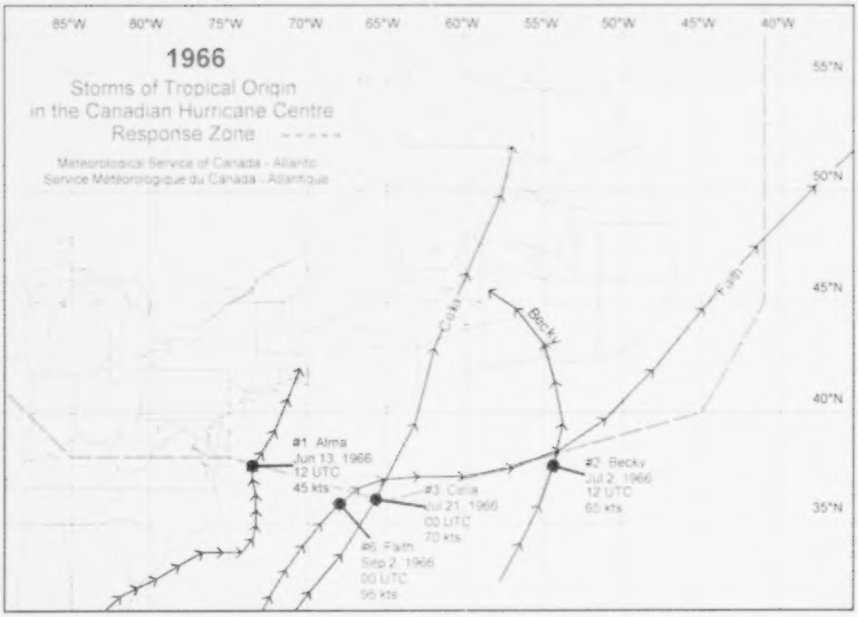
1965–Anna

Hurricane Anna originated on August 21, 1965 off the east coast of Bermuda. Forming into a category one hurricane, Anna contained winds reaching 148 km/h (80 knots). It entered the CHC Response Zone on August 24th at its maximum strength. Hurricane Anna left the CHC Response Zone on August 25th lasting for 36 hours within region. It later dissipated on August 26th and did not cause any damage in Canada.

1965–Betsy

After forming on August 27, 1965 Hurricane Betsy intensified into a category four hurricane north of French Guiana. Betsy carried winds reaching as high as 222 km/h (120 knots) during its strongest point. However, Betsy was a weakening system when it entered the CHC Response Zone on September 12th as a tropical depression. It brought winds of 37 km/h (20 knots) to the region. Betsy only lasted within the CHC Response Zone for one day before dissipating on September 13, 1965 and did not impact Canada.

1966 – MAP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1966
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Celia
Becky
Faith
#1 Alma
Jun 13, 1966
12 UTC
45 kts
#3 Celia
Jul 21, 1966
00 UTC
70 kts
#6 Faith
Sep 2, 1966
00 UTC
95 kts
#2 Becky
Jul 2, 1966
12 UTC
65 kts

1966–Alma

Developing in the Caribbean Sea on June 4, 1966 Hurricane Alma became a category three hurricane. Alma created winds that blew as strong as 204 km/h (110 knots) during its strongest point. As it entered the CHC Response Zone on June 13th Alma was downgraded to a tropical storm. It brought winds of 83 km/h (45 knots) to the CHC Response Zone. Alma continued within the CHC Response Zone until June 15, 1966 when it dissipated without having damaged Canada.

1966–Becky

Originating east of Bermuda on July 1, 1966 Hurricane Becky intensified into a category one hurricane. It entered the CHC Response Zone on July 2nd. Becky packed winds of 120 km/h (65 knots) at its maximum strength and upon entering the CHC Response Zone, however, it weakened to just below hurricane strength before moving into southeastern

Canadian waters near midnight July 2-3. It later dissipated on July 3rd and did not damage Canada.

1966–Celia

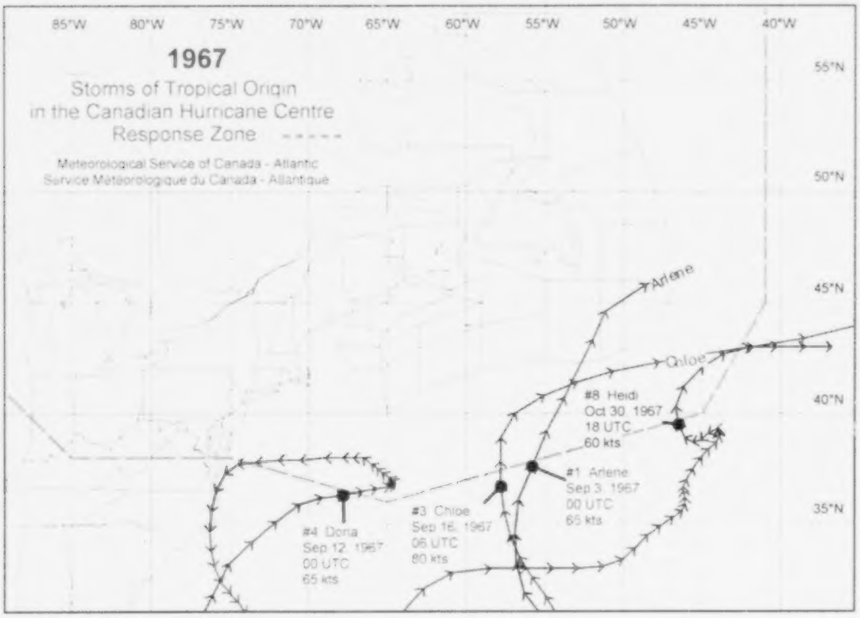
Celia made landfall over southeastern Cape Breton, Nova Scotia as a category one hurricane on the afternoon of July 21, 1966. It maintained strength and continued in a northeasterly direction to pass over Port aux Basques, Newfoundland. Winds were recorded at 120 km/h (65 knots) at landfall in both provinces. Celia also made landfall over Quebec and Labrador as a tropical depression with winds of 46 km/h (25 knots) on July 22nd.

Hurricane Celia formed off the northeast coast of the Virgin Islands on July 13, 1966. Developing into a category one hurricane, Celia contained winds blowing at 130 km/h (70 knots). On July 21st, Hurricane Celia entered the CHC Response Zone at its maximum strength. Only lasting within the CHC Response Zone for one day, Celia entered Canadian waters near dawn with 130-km/h (70-knot) winds and maintained marginal hurricane force winds as it made landfall in Cape Breton on the afternoon of the 21st. Celia became absorbed into a larger storm system later that night over Newfoundland.

1966–Faith

Hurricane Faith originated off the coast of Guinea on August 21, 1966. It formed into a category one hurricane containing winds of 120 km/h (65 knots). Faith entered the CHC Response Zone on September 2nd at its maximum strength. While remaining in the CHC Response Zone for three days, Hurricane Faith dissipated on September 4th, but did not result in any damage in Canada.

1967 – MAP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40°N
35°N
1967
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Arlene
Chloe
#8 Heidi
Oct 30 1967
18 UTC
60 kts
#1 Arlene
Sep 3 1967
00 UTC
65 kts
#3 Chloe
Sep 16 1967
06 UTC
80 kts
#4 Doria
Sep 12 1967
00 UTC
65 kts

1967–Arlene

Hurricane Arlene began on August 28, 1967 west of the Cape Verde Islands. Arlene developed into a category one hurricane and contained winds of 139 km/h (75 knots) when it was at its maximum strength. It entered the CHC Response Zone on September 3rd, moving into the Grand Banks waters near noon as a 139-km/h (75-knot) hurricane. The storm weakened quickly to a tropical storm in the Grand Banks and eventually dissipated on September 4th. It was also at its maximum strength while entering the CHC Response Zone, but did not cause any damage in Canada.

1967–Chloe

Hurricane Chloe formed near the Cape Verde Islands on September 5, 1967. While developing into a category two hurricane, Chloe contained winds reaching 176 km/h (95 knots). It entered the CHC Response Zone as a category one hurricane on September 16th and brought a maximum wind of 148 km/h (80 knots) to the CHC Response Zone. Chloe left the CHC Response Zone on September 18th and diminished on September 21st. Chloe did not result in any damage reported in Canada.

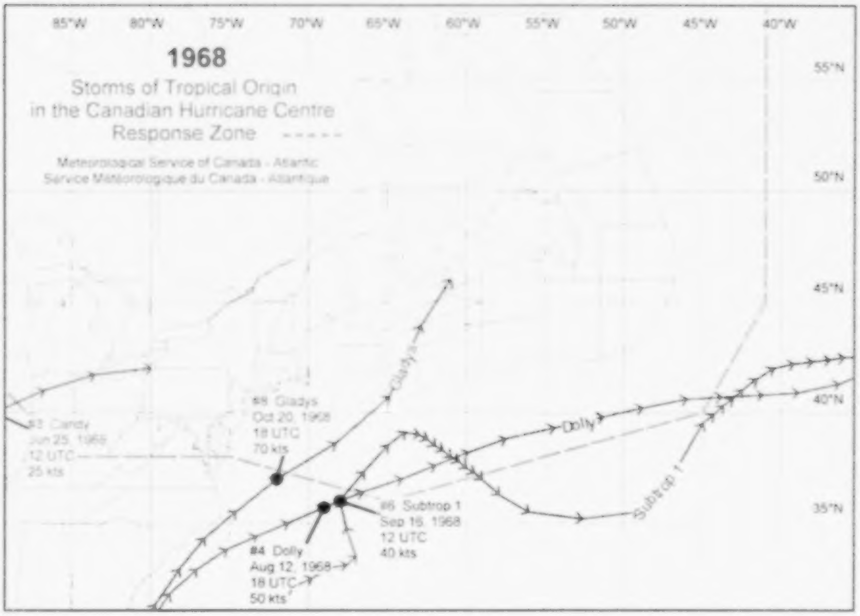
1967–Doria

Hurricane Doria developed on September 8, 1967 off the east coast of Florida. Doria only strengthened into a category one hurricane and contained winds of 139 km/h (75 knots). While entering the CHC Response Zone on September 12th Doria was still a category one hurricane. It also contained winds at 139 km/h (75 knots). It passed over the CHC Response Zone and left the region on September 16th, however it did not dissipate until September 21st. Doria did not impact Canada.

1967–Heidi

Beginning east of the Bahamas on October 19, 1967 Hurricane Heidi formed into a category one hurricane. Heidi contained winds of 148 km/h (80 knots) when it reached its maximum strength. It entered the CHC Response Zone with tropical storm status and winds of 111 km/h (60 knots) on October 30th. It remained within the zone until November 1st when it dissipated and did not cause any damage in Canada.

1968 – MAP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40°N
35°N
1968
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#3 Candy
Jun 25, 1968
12 UTC
25 kts
#8 Gladys
Oct 20, 1968
18 UTC
70 kts
Gladys
#4 Dolly
Aug 12, 1968
18 UTC
50 kts
Dolly
#6 Subtrop 1
Sep 16, 1968
12 UTC
40 kts
Subtrop 1

1968–Abby

Abby originated just east of the Yucatan Peninsula on June 1, 1968. Abby formed into a category one hurricane with winds of 120 km/h (65 knots). Hurricane Abby never entered the CHC Response Zone, however its affects were felt throughout Nova Scotia. It brought heavy rain and high winds to the region. Abby dissipated on June 13th.

NOVA SCOTIA

June 15, 1968

- Unofficial reports of 150 mm (5.9 in) of rain fell in less than 24 hours in Harbourville (HH)
- Low-lying areas and roads were flooded and washed out (HH)

1968–Candy

Candy made landfall over Ontario as a tropical depression with winds of 46 km/h (25 knots) on June 26th.

Candy formed in the southwestern Gulf of Mexico just off the coast of Mexico on June 22, 1968. Candy's maximum strength was a tropical storm with 111 km/h (60 knots) winds. Upon entering the CHC Response Zone on June 25th, Candy had weakened to a tropical depression and carried winds of 46 km/h (25 knots). The storm re-intensified during its post-tropical phase and developed storm force winds over Ontario. Besides the high winds, this system brought heavy rain to the Ontario region, together knocking out power and closing streets. The storm diminished on June 26th after spending one day in the CHC Response Zone.

ONTARIO

June 26, 1968

- Winds of 95 km/h (52 knots) (TS)
- Windsor had 82 mm (3.2 in) of rain, London, 85 mm (3.4 in) of rain, and Simcoe, 94 mm (3.7 in) of rain (TS)
- At the Windsor polling station, power was knocked out and they were forced to use candles (TS)
- Eight Chatham streets were closed and many boats in the area had to be salvaged (TS)

1968–Dolly

Dolly originated just off Florida's southeastern tip between the Bahamas and Florida on August 10, 1968. Dolly developed into a category one hurricane bringing winds of 129 km/h (70 knots). It entered the CHC Response Zone on August 13th and diminished on August 17th. Dolly did not impact Canada.

1968–Subtrop 1

Subtrop #1 formed east of the Florida panhandle on September 14, 1968. The storm developed into a category one hurricane containing winds of 129 km/h (70 knots). Subtrop #1 entered the CHC Response Zone on September 16th. Remaining there for another week, Subtrop #1 dissipated on September 23rd, although the storm did not impact Canada.

1968–Gladys † (2 Canadian fatalities)

On the afternoon of October 21st, Gladys made landfall along the eastern shore of Nova Scotia with category one hurricane winds of 120 km/h (65 knots).

Gladys formed south of the Greater Antilles on October 13, 1968. It reached category one hurricane status with 140 km/h (75 knots) winds. Gladys became slightly weaker upon entering the CHC Response Zone on October 20th. Near midnight Gladys entered Canadian waters as a marginal hurricane and made landfall near noon over eastern Nova Scotia with winds of 120 km/h (65 knots). **One person drowned** and another four were injured in Cape Breton. **Another man was killed when a tree crashed through the cab of his truck on Prince Edward Island.** Flooding occurred throughout New Brunswick and Nova Scotia. Gladys turned north northeastward and gradually became extratropical as it merged with a cold front off the coast of Nova Scotia shortly after landfall.

- One person was killed in Cape Breton (CDD)
- Rainfall of 45–90 mm (1.8–3.6 in) caused flooding in New Brunswick and Nova Scotia (CDD)

NOVA SCOTIA

October 22, 1968

- Up to 70 mm (2.7 in) of rain in parts of the province, approximately 50 mm (2 in) of rain in Cape Breton and the highest wind gust reported was 105 km/h (57 knots) in Sydney (HH)
- One person was injured in Cape Breton (HH)

NEW BRUNSWICK

October 22, 1968

- 3.5 cm (1.4 in) of snow fell on Upsalquitch (TJ)
- More than 105 mm (4.1 in) of rain fell in Moncton (TJ)

PRINCE EDWARD ISLAND

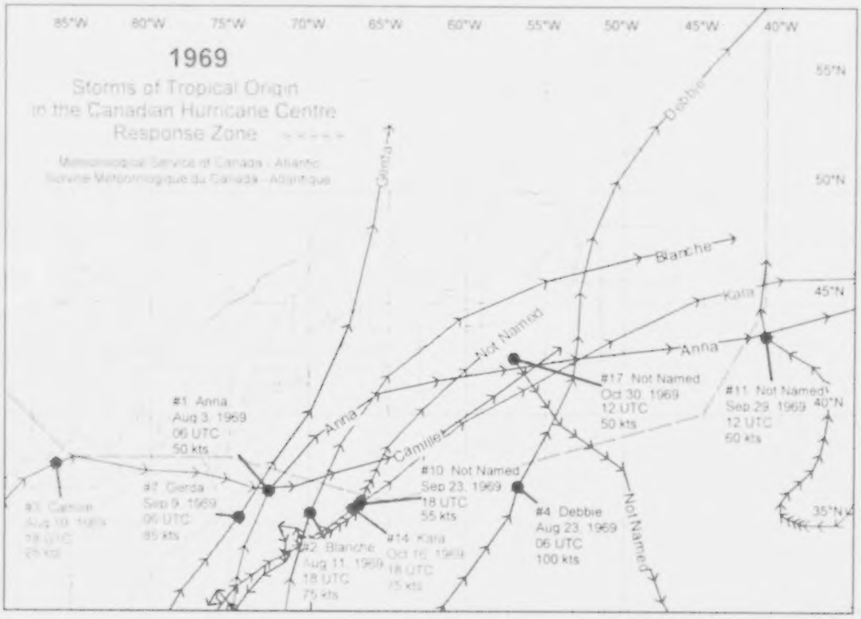
October 22, 1968

- A man was killed when a tree crashed through the cab of his truck on Church Street in Alberton (HH)
- Gusts of 137 km/h (74 knots) winds in Charlottetown (TJ)
- 35 fishing boats valued up to *$10,000* each were heavily damaged (G)

October 23, 1968

- Washouts occurred on the north side of the Kildare Bridge near Alberton and a 60 m (200 ft) section of the outer wharf at Miminegash was washed out (G)
- O'Leary Elementary School suffered extensive damage from flooding (G)

1969 – MAP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1969
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Gerda
Debbie
Blanche
Kara
Anna
Not Named
Camille
#1 Anna
Aug 3, 1969
06 UTC
50 kts
#17 Not Named
Oct 30, 1969
12 UTC
50 kts
#11 Not Named
Sep 29, 1969
12 UTC
60 kts
#10 Not Named
Sep 23, 1969
18 UTC
55 kts
#3 Camille
Aug 19, 1969
18 UTC
25 kts
#7 Gerda
Sep 9, 1969
06 UTC
85 kts
#2 Blanche
Aug 11, 1969
18 UTC
75 kts
#14 Kara
Oct 16, 1969
18 UTC
75 kts
#4 Debbie
Aug 23, 1969
06 UTC
100 kts

1969–Anna

Tropical Storm Anna began on July 25, 1969, south of the Cape Verde Islands. The path of Anna was a rather classical one, beginning near the African coast, passing within 240 km (150 mi) of Cape Hatteras, and finally moving into the North Atlantic. Anna joined a vigorous extratropical low pressure system north of the Azores. Anna's maximum winds were 111 km/h (60 knots) and the storm entered the CHC Response Zone and she was still at 102 km/h (55 knots) when she entered Canadian waters on the afternoon of August 3rd. This storm remained in the southern half of the CHC Response Zone and tracked almost due east over water and did not have an impact on Canada. Anna exited the CHC Response Zone on the afternoon of August 5th. Anna was the first of 8 tropical storms or hurricanes that entered Canadian waters in 1969; no year before or since has seen that many move into Canadian waters in one year.

1969–Blanche

Blanche, as a tropical disturbance, can be traced back to about 2,100 km (1,300 mi) east of the Lesser Antilles. Maximum winds were on the order of 139 km/h (75 knots). The hurricane, with its maximum winds, entered Canadian waters near midnight August 11-12 and passed just to the northwest of Sable Island and skirted by Cape Race, Newfoundland later that day. Although Sable Island experienced winds of 83 km/h (45 knots) with gusts to 111 km/h (60 knots), no strong winds were observed at any other stations in the Maritimes. The hurricane filled rapidly as it passed Newfoundland and became absorbed into a frontal zone on August 13th. This storm had little impact on Canada.

NEWFOUNDLAND

August 13, 1969

- Over 50 ships from over four countries took shelter from the storm in St. John's harbour (ET)

1969–Camille

Camille formed near the island of Grand Cayman in the Caribbean on August 14, 1969. Camille further joined a tropical wave that had been tracked from the African coast where it emerged on August 15th. Camille reached an impressive category five hurricane with winds of 306 km/h (165 knots). The track of this storm took it north through the Mississippi Valley where it veered due east in Kentucky and headed for the coast. Upon re-entering the water, Camille turned to a northeast direction and moved parallel to Nova Scotia and Newfoundland. Just prior to dying as a tropical system, Camille entered Canadian waters, bringing winds of 102 km/h (55 knots) to the far offshore areas. No damage was reported from Camille during its lifetime in the CHC Response Zone from August 21st to August 24th.

1969–Debbie

A large mass of clouds off the African coast developed into a depression on August 14, 1969 and Hurricane Debbie formed southwest of the Cape Verde Islands on August 15th.

Debbie reached its greatest strength with winds of 185 km/h (100 knots) on August 20th, and then turned toward the north-northeast on August 21st. Debbie moved into Canadian waters on the afternoon of August 23rd as a category two hurricane with winds of 167 km/h (90 knots). After passing just east of Newfoundland on August 24th, the storm lost force rapidly over the extremely cold waters and died east of Greenland. The highest winds of up to 137 km/h (74 knots) were reported in Newfoundland but no damage was done.

NEWFOUNDLAND

August 25, 1969

- 96 km/h (52 knots) winds in eastern Newfoundland (ET)
- 25 mm (1 in) of rain on the Avalon and Bonavista Peninsulas (ET)
- 137 km/h (74 knots) winds in St. John's (ET)
- No damage reports (ET)

1969–Gerda

Hurricane Gerda made landfall near St. Stephen, New Brunswick and then moved north to make landfall again over northern Quebec early on September 10th. At this time, winds of 175 km/h (95 knots) accompanied this category two hurricane. Gerda eventually hit Labrador later that day as a weaker category one hurricane with winds of 130 km/h (70 knots). Gerda has been the only hurricane of any strength to hit Labrador during the period of 1901-2000.

On September 6, 1969, Hurricane Gerda was born near the Bahamas. Gerda's maximum winds were 204 km/h (110 knots). Gerda moved along the United States eastern seaboard and then turned nearly due north. Gerda moved over the extreme western portions of the Bay of Fundy waters on September 9th as a category three hurricane before making landfall in New Brunswick just before dawn as a strong category two hurricane. Winds of 133 km/h (72 knots) were recorded in Yarmouth, Nova Scotia and crop, tree and structural damage was reported in Nova Scotia and New Brunswick. Gerda left the CHC Response Zone on September 12th in the vicinity of Labrador.

NOVA SCOTIA

September 10, 1969

- 133 km/h (72 knots) winds in Yarmouth (HH)

- Tore shingles from roofs and blew down trees in the province (HH)
- Power outages in Yarmouth, Halifax, and Digby (HH)
- The *Bluenose* ferry trip to Bar Harbour, Maine was cancelled from Yarmouth (HH)
- *$3.6 million* of apples destroyed in the Annapolis Valley (HH)
- Five incoming and outgoing flights cancelled at the Halifax International Airport (HH)

September 11, 1969

- Kept most boats ashore in the 20th International Tuna Cup Match in Yarmouth (HH)

NEW BRUNSWICK

September 10, 1969

- 74–92 km/h (40–50 knots) winds in the province (TJ)
- Phone lines down from Saint John to Mace's Bay (TJ)
- Power outages on Campobello Island and Saint John area (TJ)
- Winds blew over trees, blew down a shed, and wrecked some farm equipment in Seal Cove (TJ)
- Damage was minimal (TJ)
- Plate glass window broken at the front of the Simpsons-Sears Store on Lansdowne Avenue in Saint John (TJ)
- A man beached his sail boat on the rock near Island View Park (TJ)

1969–NN-1

NN-1 originated on September 21, 1969, east of Cape Hatteras. As a category one hurricane, maximum winds were 120 km/h (65 knots). NN-1 travelled in a northeasterly direction and remained south of Nova Scotia and Newfoundland. The storm moved into Canadian waters on September 25th as a marginal category one hurricane. This storm left the CHC Response Zone on September 27th and did not have any recorded affects on Canadian waters.

1969–NN-2

Tropical Storm NN-2 developed near the Azores on September 24, 1969. NN-2 moved north-northwest and entered the CHC Response Zone over water on the evening of September 28th. With preliminary maximum winds of 111 km/h (60 knots), this storm rapidly lessened on September 29th in the CHC Response Zone, south of Newfoundland. No damages were reported from the storm.

1969–Subtrop

Subtrop became a named disturbance on September 29, 1969, northwest of Cuba. This tropical storm contained winds of 93 km/h (50 knots). Subtrop tracked north for days through the middle of the southeastern United States, eventually reaching Lake Ontario. By this time, Subtrop was a low pressure system and did not have any impacts on Canada. Upon reaching Lake Ontario, the storm veered due east and headed out over water and exited the CHC Response Zone's eastern most boundary days later.

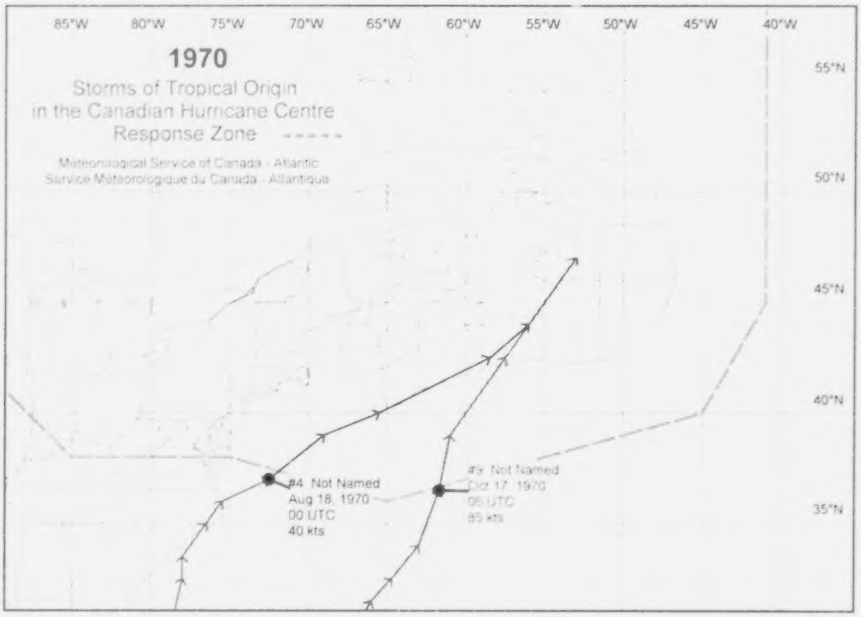
1969–Kara

Hurricane Kara was born east of the Bahamas on October 7, 1969. During the early days of development, Kara was imbedded in a cold trough extending from the southwest Caribbean north-northeast through Cuba into the southwest Atlantic. Kara's maximum sustained winds reached 167 km/h (90 knots) making the storm a category two hurricane. Kara came into the CHC Response Zone heading in a northeasterly direction over the water, on the evening of October 17th and remained at category-two strength as it entered Canadian waters. Kara remained in the southern portion of the CHC Response Zone away from any land and departed on October 19th. Kara was the 5th hurricane in Canadian waters in 1969, the most in any recorded year, either before or since.

1969–NN-3

Tropical Storm NN-2 developed over southeastern Canadian waters but subsequently tracked southward. Winds of 93 km/h (50 knots) did not remain in Canadian waters very long.

1970 – MAP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45°N
40°N
35°N
1970
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#4 Not Named
Aug 18, 1970
00 UTC
40 kts
#9 Not Named
Oct 17, 1970
06 UTC
85 kts

1970–Alma

Hurricane Alma formed early in the year on May 17, 1970, in the Caribbean Sea. Maximum winds obtained were 130 km/h (70 knots). Alma entered the CHC Response Zone just off the coast of Virginia and headed northeast towards Nova Scotia. Alma dissipated rapidly and had no impacts on Canada.

1970–NN-1

NN-1 originated east of Florida on August 15, 1970. This tropical storm contained winds of 111 km/h (60 knots). NN-1 tracked along the United States eastern seaboard before veering to an east-northeast direction off South Carolina and entered Canadian waters as a tropical storm with winds of 111 km/h (60 knots) on the morning of August 18th. The storm remained over the extreme southern waters as it tracked parallel to Nova Scotia and Newfoundland causing ***thousands of dollars*** damage to boats and property in parts of

Newfoundland. Winds of 98 km/h (53 knots) were recorded in St. John's, Newfoundland. On the evening of August 20th, the storm left the CHC Response Zone.

NEWFOUNDLAND

August 19, 1970

- *Thousands of dollars* of damage to the Avalon Peninsula (ET)
- Numerous small boats in Long Pond sank (ET)
- Many boats and yachts had broken loose and were adrift in Long Pond (ET)
- A few streets were flooded in St. John's (ET)

August 20, 1970

- 98 km/h (53 knots) winds and 101 mm (4 in) of rain in 48 hours in St. John's (ET)
- Several small boats swamped at Paddy's Pond and other areas along the Avalon Peninsula (ET)
- Two small seaplanes were also swamped by the storm at Paddy's Pond (ET)
- No major damage in St. John's (ET)
- Some basements flooded in St. John's, and some minor damage to trees (ET)
- West End of St. John's was without power for 1.5 hours (ET)
- Flooding on the Blackhead Road, St. John's (ET)

1970–NN-2

On October 17th at 23:30 UTC, NN-2 crossed over the Avalon Peninsula with winds of 130 km/h (70 knots) classifying it as a category one hurricane.

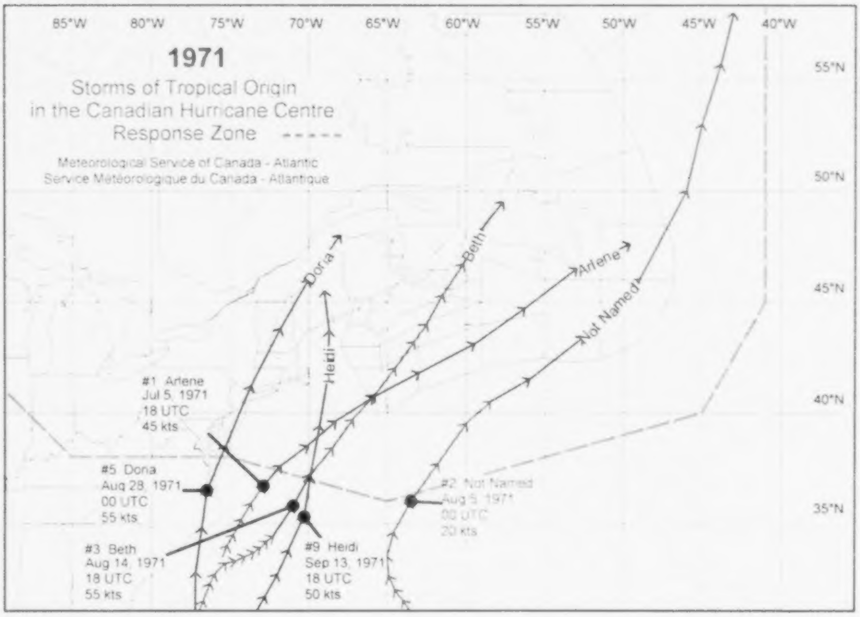
NN-2 developed east of Bermuda on October 14, 1970. Maximum winds produced by NN-2 were 145 km/h (80 knots). The storm reached hurricane strength and entered the southwestern Grand Banks as a 167-km/h (90-knot) hurricane on the afternoon of October 17th and made landfall on the Avalon Peninsula of Newfoundland only 6 hours later with winds of 130 km/h (70 knots). *Thousands of dollars* in boat, tree and structural damage was reported and winds were clocked at 145 km/h (80 knots) over the Burin Peninsula. The storm dissipated off the northeast coast of Labrador on October 20th.

NEWFOUNDLAND

October 19, 1970

- 145 km/h (80 knots) winds on the Burin Peninsula (ET)
- *Thousands of dollars* of damage on the Burin Peninsula (ET)
- Windows blown out and trees uprooted across Newfoundland (ET)
- One house was abandoned after it looked like the roof was going to blow off in St. John's (ET)
- A house under construction blew down in Marystown (ET)
- Fences and trees were blown down in Burin (ET)
- Hydro poles caught fire in Burin and Grand Bank (ET)
- Several fishing dories were sunk or damaged in Grand Bank (ET)
- Three fishing premises was washed away in Lamaline (ET)
- A fishing ramp was also washed out to sea in Lourdes Cove (ET)
- In St. Pierre, France, several homes and a church had their roofs blown off (ET)

1971 – MAP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55°N
50°N
45°N
40°N
35°N
1971
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Dona
Heidi
Beth
Arlene
Not Named
#1 Arlene
Jul 5, 1971
18 UTC
45 kts
#5 Dona
Aug 28, 1971
00 UTC
55 kts
#3 Beth
Aug 14, 1971
18 UTC
55 kts
#9 Heidi
Sep 13, 1971
18 UTC
50 kts
#2 Not Named
Aug 5, 1971
00 UTC
20 kts

1971–Arlene

Tropical Storm Arlene began on July 4, 1971 220 km (135 miles) off Cape Hatteras. Entering the CHC Response Zone on July 6th and then into Canadian waters later that afternoon. Arlene brought winds of 101 km/h (55 knots) to the region. Arlene eventually dissipated on July 8th after capsizing a boat on the Grand Banks of Newfoundland.

NEWFOUNDLAND

July 8, 1971

- 12 fishermen were found safe when there fishing boat was swamped and sank while hauling their cod traps in Lords Cove, Grand Bank during the tropical storm. Winds were reported to be light at the time, however within minutes, mountainous seas were created by the passing storm. (ET)

1971–Beth † (1 Canadian fatality)

Making landfall on Copper Lake, Nova Scotia, Hurricane Beth continued over Cape Breton, Nova Scotia on August 16, 1971. Maximum winds for this category one hurricane upon landfall were 120 km/h (65 knots). Beth also made landfall over Newfoundland as a tropical storm with winds of 111 km/h (60 knots) on August 17th.

Hurricane Beth developed off the east coast of Florida on August 10, 1971 into a category one hurricane. Beth passed into the CHC Response Zone on August 15th, moving into Canadian waters as a 139-km/h (75-knot) hurricane on the afternoon of the 15th. Twenty four hours later Hurricane Beth made landfall over eastern Nova Scotia. As well as hurricane-force winds the storm brought flooding rain. Roads were washed away, several bridges fell, and there was damage to crops throughout Nova Scotia. **One man was killed in a storm-induced automobile accident.** Damage was estimated at more than ***$10 million.***

- Fresh water supplies were left contaminated for days because of extensive runoff into Lake Antigonish (CDD)
- Estimated Cost is ***$10.7 million*** (CDD)
- Hurricane Beth website: **www.dunmac.com/~sheetharbour/beth.html**
- The Mill in Sheet Harbour was damaged by the breaking of the dam (CDD)

NOVA SCOTIA

August 16, 1971

- Liverpool received 165 mm (6.6 in) of rain (HH)
- Enfield Bridge collapsed (HH)
- The Bicentennial Highway between Enfield and the airport was closed (HH)
- The James River Bridge on the Trans Canada Highway between Antigonish and Truro had been washed away (HH)
- Highway 102 was washed out 3 km (2 mi) south of Enfield and Wellington (HH)
- The Hawthorne Street Bridge on the Northumberland Shore Highway and the Sherbrooke Bridge on the Highway 7 both collapsed (HH)
- Railway tracks were covered by water and the Canadian National freight trains were cancelled. In addition, a rail liner was stopped at Stellarton (HH)
- In Antigonish, merchants began placing sandbags around their stores in efforts to keep out floodwaters (HH)
- Saint Frances Xavier University dorms were opened to families on the outskirts who were washed out of their homes (HH)
- In Halifax, some roads were closed, bus service was suspended in areas and rerouted in others (HH)

- Extreme flooding on the Bedford Highway was reported and Bus 4 was cancelled (HH)
- Bus 5A was cancelled for several hours after flooding of the Halifax Rotary prevented vehicle passage (HH)
- One lane of the Highway 7 was washed away near Lake Echo in Dartmouth (HH)
- One flight to Halifax from Montreal was cancelled (HH)
- The Coast Guard had reported one accident during the hurricane and it towed the 25 m (81 ft) *Marlene and Kyle* fishing boat into Shelburne after having engine problems (HH)
- Bridges and highways across Nova Scotia were washed away on Sunday night because of flooding (HH)
- Cars were lying afloat in their driveways, parking lots became lakes and many county roads were washed away (HH)
- Some telephone lines were down but power remained on (HH)

August 17, 1971

- Two serious accidents were reported in the Strait of Canso area on Highway 19 near each other, one man was killed while another was seriously injured (HH)
- Kentville Research Center measured 5.4 mm (0.2 in) of rain (HH)
- 10.5 mm (0.4 in) of rain fell at Halifax International Airport by Monday morning (GM)
- Destruction is estimated to be in the ***millions of dollars***. Dartmouth was hit the hardest with approximately ***$1.5 million*** in damage. Antigonish estimates are predicted to be ***$1 million*** (HH)
- Porters Lake Bridge was closed when part of an abutment was washed out (HH)
- St. Marys River spilled over its bank and blocked Trunk 7 at Aspen and Stillwater (HH)
- Pictou and Antigonish had 12 small bridges washed out on secondary roads (HH)
- Some washouts were reported on Whycocomagh-Mabou Road (HH)
- Proportions of the Banook Canoe Club dam wall collapsed (HH)
- Flooding problem areas included: Windmill Road by the Canadian National Railway overpass, Jayden Drive, Wanda Lane, Bellevista Drive, Woodside near Crawford Street, Imperial Oil near Canadian National Railway overpass and Foster Street (HH)
- The city's water supply was overflowing at Lake Lamont (HH)
- Eastern Auto reported several cars and trucks floated away (HH)
- Antigonish's Five-To-A-Dollar Store reported severe damage to its basement and its stock (HH)
- Two draggers were swamped at Margaretsville and there was damage to a Halls Harbour weir (HH)

- Falmouth had a three hour power failure when a tree branch fell on a wire, and the flood washed out the community's reservoir dam (HH)
- In New Glasgow, several basements were flooded (HH)
- Cumberland's cereal grain crop appeared to be the hardest hit (HH)
- A few cellars were damaged along the south shore (HH)
- Dayspring/Bridgewater experienced brief power outages (HH)
- The Halifax Pulp and Paper Company Mill at Sheet Harbor was completely flooded by West River (HH)
- Annapolis Valley railway tracks were washed out Monday at Hantsport (HH)
- Sullivans Pond was overflowing and the culverts and the canal system could not cope with the overflow. The water was flowing down Ochterloney Street (GM)
- Part of Route 102 and Trans Canada Highway was flooded (GM)
- Amherst area reported some minor accidents on Sunday and Monday (HH)
- 2.5 m (8 ft) of water was reported in Antigonish's Sobeys grocery store while the Co-op grocery store in Antigonish also suffered considerable damage (HH)
- The new Antigonish Regional High School was flooded
- Blue Acres Road in the Stellarton area was completely submerged and closed to traffic (HH)
- Fields in Kings County were damaged by the high winds and rain, and there was extensive damage to corn and tobacco fields (HH)
- The highways to Cape George and to Sherbrooke were closed because of a number of river bridges were overflowing (HH)
- Farmland was turned into vast lakes in Nova Scotia (GM)

August 18, 1971

- 294 mm (11.7 in) of rain fell at Halifax International Airport, 70 mm (2.7 in) in Sydney (HH)
- Trunk 2 at Elmsdale was flooded (HH)
- Hawthorne Street running over to Crichton Avenue and Prince Albert Road was seriously affected. The bridge connection Lake Banook and Sullivans's Pond had broken and was swept way (DFP)
- Extensive damage was caused by the overflow of Lamont Lake near the city's water supply (DFP)
- Alderney Drive and Portland Street was impassable so drivers had to use the Mic Mac Rotary (DFP)
- Cost the city ***$1 million*** to repair the damages (DFP)
- 20 bridges, most of them small, were washed away throughout the province (HH)

August 21, 1971

- Nova Scotia Highways Minister estimated that the repairs and replacing would cost about ***$925,000***. ***$509,000*** for roads and ***$415,000*** for bridges (GM)

PRINCE EDWARD ISLAND

August 16, 1971

- Charlottetown only received 4 mm (0.2 in) from 3:00 am to 9:00 pm ADT (HH)
- Hundreds of acres of tobacco crops were toppled by the high wind (G)
- Grain was hit hard too (G)

1971–Doria

Doria made landfall over New Brunswick and Quebec as a tropical storm with winds of 65 km/h (35 knots) on August 29th.

Tropical Storm Doria originated on August 20, 1971 east of Daytona Beach, Florida carrying winds of 101 km/h (55 knots). Doria entered the CHC Response Zone on August 28th as a tropical storm. In the early morning hours of August 19th Doria moved into the Madawaska panhandle of New Brunswick before the system dissipated.Damage was felt throughout Ontario and Quebec as heavy rains flooded several areas, and damaged boats. Doria later diminished on August 29th.

- Flooding occurred in the Bois-Francs region, and in Thetford Mines, Victoriaville and Warwick (CDD)
- Damage cost was estimated at *$8.677 million* (CDD)

ONTARIO

August 30, 1971

- Dozens of small boats sunk in the Ottawa River (GM)
- Caused a lot of damage to Highway 2 (GM)
- Part of the roof at a Woolco store on Highway 2 collapsed under the weight of the rain that collected on the roof (GM)
- Three cars were stranded on Highway 2 in 1.8 m (6 ft) of water (GM)

QUEBEC

August 30, 1971

- 65 mm (2.6 in) of rain fell in Quebec between 7:00 pm and 1:30 am EDT (GM)
- Chaudiere River was flooded in several places in Beauce County. Particularly at St. Joseph and Beauceville which forced several roads to close (GM)

- The current carried about 20 boats away in the area where the Chaudiere River flows into the St. Lawrence River near Quebec City (GM)

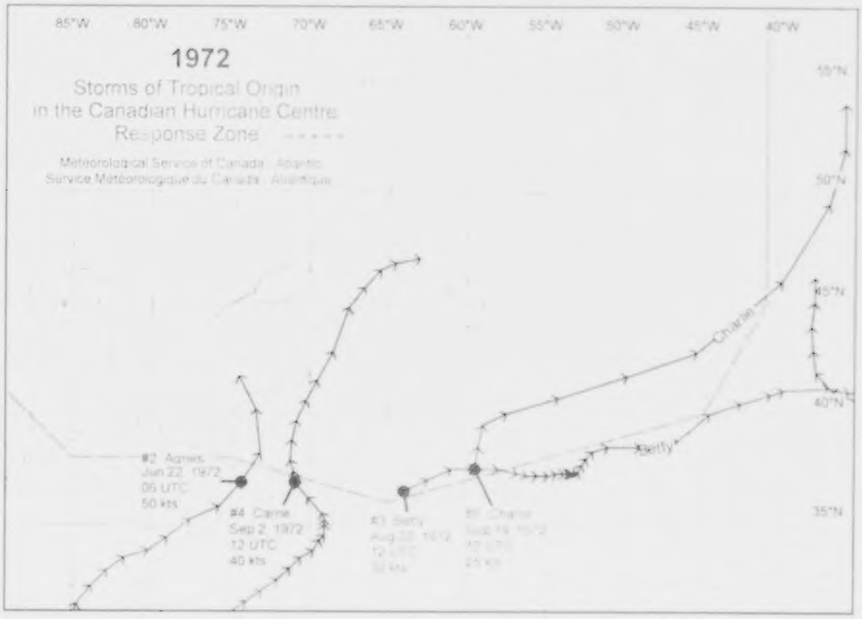
1971–Heidi

Tropical Storm Heidi started on September 11, 1971 approximately 740 km (400 nautical miles) east of Jacksonville, Florida. Only strengthening to tropical storm status, Heidi carried winds of 101 km/h (55 knots). After entering the CHC Response Zone on September 14th, Heidi was absorbed by a low pressure system as it moved into Maine on September 15th and did not cause any damage in Canada.

1971–NN-1

Storm NN-1 originated on August 3, 1971 as a tropical depression south of Bermuda. After entering the CHC Response Zone on August 5th the storm turned northeast and began strengthening. The storm reached tropical storm status before entering Canadian waters late on the evening of the 5th and reached hurricane strength while tracking through eastern Newfoundland waters. Winds of 139 km/h (75 knots) were reached inside Canadian waters before the storm exited eastward and moved out into the Atlantic. The storm eventually dissipated on August 7th without impacting Canada.

1972 – MAP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1972
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2 Agnes
Jun 22 1972
06 UTC
50 kts
#4 Carrie
Sep 2 1972
12 UTC
40 kts
#3 Betty
Aug 22 1972
12 UTC
Charlie
Sep 19 1972
12 UTC
25 kts
Charlie
Betty

1972–Agnes

A strong depression named Agnes, formed on June 14, 1972 and moved eastward from the Yucatan Peninsula towards Cuba, on June 15th. Agnes became a hurricane on June 18th with sustained surface winds of 138 km/h (75 knots). Agnes tracked over land in the United States before heading back out to sea over North Carolina, but then backing towards the land again making landfall over New York on June 22nd. The storm never reached Canada and dissipated south of Ottawa, Ontario, on June 23rd.

1972–Betty

The first evidence that a disturbance would develop into Hurricane Betty appeared on August 21, 1972 in an area located about 460 km (285 mi) north-northwest of Bermuda. Betty officially was named on August 22nd and grew to a category two hurricane with winds of 167 km/h (90 knots). Betty weakened rapidly and remained well south of

Canadian waters, barely entering the CHC Response Zone's southern edge. Betty left the CHC Response Zone on August 23rd and had no impact on Canada.

1972–Carrie

Carrie made landfall over New Brunswick as a tropical storm with winds of 93 km/h (50 knots) on September 4th. Carrie also made landfall over Prince Edward Island as a tropical storm with winds of 74 km/h (40 knots) on September 5th.

On August 29, 1972, a disturbance called Carrie formed off the southeast Florida coast and began moving northward. On September 1st, the strongest sustained winds were only 75 km/h (40 knots), and the storm appeared to be 'torn apart' on satellite pictures. The centre finally crossed the coast near Eastport, Maine, on the morning of September 4th, entering New Brunswick just before noon, and then moved into the Gulf of St. Lawrence as it gradually weakened. The official storm track shows winds of 93 km/h (50 knots) with Carrie as she entered New Brunswick and the Gulf of St. Lawrence, however, storm damage was reported throughout New Brunswick with wind reports of 111 km/h (60 knots). Carrie dissipated in the Gulf of St. Lawrence on September 6th.

NEW BRUNSWICK

September 5, 1972

- Winds 75 km/h (44 knots) gusting to 95 km/h (52 knots) and 35 mm (1.4 in) of rain in Saint John (TJ)
- Telephone wires and trees down in Saint John (TJ)
- Power outages on Douglas Avenue in Saint John (TJ)
- No reports of flooding the Saint John area (TJ)
- Large tent used for meetings was destroyed, causing *$3,000* of damage (TJ)
- *Princess of Acadia* ferry was three hours late leaving Saint John (TJ)

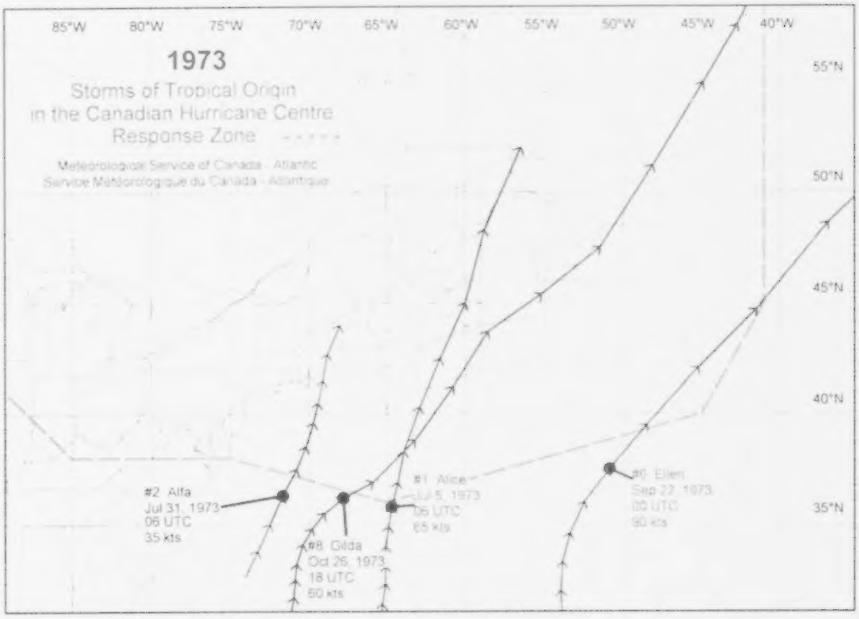
September 6, 1972

- Winds reaching 90 km/h (48 knots) in Charlo (HH)
- Six boats in Charlo were destroyed or severely damaged (HH)
- Power outages in many northeastern communities of New Brunswick (HH)

1972–Charlie

Charlie originated east of the New England States as a subtropical storm on September 19, 1972. Maximum winds achieved were 111 km/h (60 knots). Charlie tracked east-northeast and remained in the southern portions of the CHC Response Zone from September 19–21. There were no impacts on Canada from Charlie.

1973 – MAP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1973
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2 Alfa Jul 31, 1973 06 UTC 35 kts
#8 Gilda Oct 26, 1973 18 UTC 60 kts
#1 Alice Jul 5, 1973 06 UTC 65 kts
#6 Ellen Sep 22, 1973 00 UTC 90 kts

1973–Alice

Alice made landfall over Newfoundland and Labrador as a tropical storm with winds of 111 km/h (60 knots) and 93 km/h (50 knots) respectively, on July 6th.

Alice began east of the Bahamas on July 1, 1973. Maximum winds attained were 148 km/h (80 knots) making it a category one hurricane. Alice entered Canadian waters in the late evening of July 5th as a marginal category one hurricane but weakened to a tropical storm of 111 km/h (60 knots) before making landfall in western Newfoundland the next afternoon. No impacts were felt from the storm as it exited the CHC Response Zone on the evening of July 8th.

1973–Alfa

Tropical Storm Alfa originated due east of South Carolina on July 30, 1973. Alfa tracked north-northeast over open waters before making landfall in Maine and eventually New Brunswick. Maximum winds produced were on the order of 111 km/h (60 knots), which occurred in the CHC Response Zone on July 31st. The storm continued its north-northeast track and retreated off the coast of Labrador days later. No reports of damage were made in Canada.

1973–Ellen

Ellen developed off the west coast of Africa, near the Cape Verde Islands, on September 4, 1973. Ellen grew to a category three hurricane with sustained winds of 185 km/h (100 knots). Ellen eventually tracked northeast and well away from any land, remaining in the southeastern part of the CHC Response Zone. Ellen left the CHC Response Zone on September 22nd and caused no damage.

1973–Gilda

Tropical Storm Gilda began on October 16, 1973, in the Caribbean Sea. Gilda reached maximum wind speeds of 120 km/h (65 knots). The storm did not weaken and headed north, then veered northeast in the CHC Response Zone, entering Canadian waters as a tropical storm of 102 km/h (55 knots) on the morning of October 27th before just missing the Avalon Peninsula on October 28th. Damage from winds and rains were felt in Newfoundland, particularly Harbour Breton. Winds of 120 km/h (65 knots) were recorded in St. John's, Newfoundland. The storm left Canadian waters on October 30th.

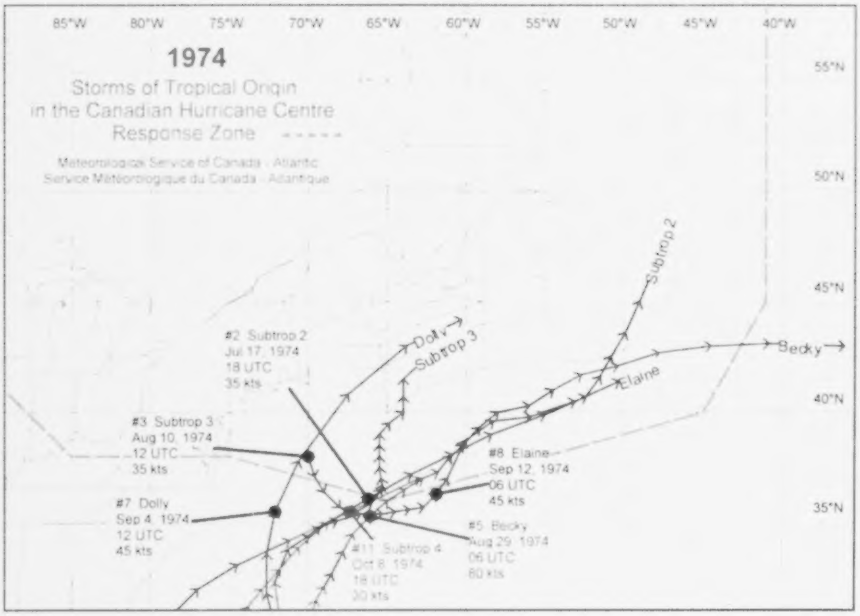
NEWFOUNDLAND

October 29, 1973

- Winds of 120 km/h (65 knots) in St. John's (ET)
- 50 mm (2 in) of rain and 3 cm (1.2 in) of snow fell in St. John's (ET)
- Flooded the only road that leads to Harbour Breton and many basements (ET)
- Power outages in Harbour Breton for almost 18 hours (ET)

- ***Several thousands of dollars*** of damage to new homes in Harbour Breton when there was a back up of drainage water (ET)
- Highway near Hermitage and Pool's Cove also flooded (ET)
- Power outages in St. John's, Bell Island, Broad Cove, Kelligrews and the St. Phillip area (ET)
- No reports of flooding in the St. John's area (ET)

1974 – MAP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1974
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Subtrop 2
Dolly
Subtrop 3
Becky
Elaine
#2 Subtrop 2 Jul 17, 1974 18 UTC 35 kts
#3 Subtrop 3 Aug 10, 1974 12 UTC 35 kts
#7 Dolly Sep 4, 1974 12 UTC 45 kts
#8 Elaine Sep 12, 1974 06 UTC 45 kts
#5 Becky Aug 29, 1974 06 UTC 80 kts
#11 Subtrop 4 Oct 8, 1974 18 UTC 30 kts

1974–Subtrop 2

Subtrop #2 began on July 16, 1974, as a tropical depression (TD) northeast of the Bahamas. The TD tracked northeast and developed into a tropical storm with maximum winds of 102 km/h (55 knots). The storm entered the southeastern Grand Banks on July 19th with winds of 83 km/h (45 knots). It dissipated the following day. Subtrop #2 did not cause any damage in Canada.

1974–Subtrop 3

Subtrop #3 originated off the east coast of the United States on August 10, 1974, forming inside the CHC Response Zone. Only becoming a tropical storm, Subtrop #3 contained winds as high as 93 km/h (50 knots). Subtrop #3 moved outside the Response Zone but re-entered it on August 10th while at its maximum strength. The storm then too 3 days to reach Canadian waters. The storm eventually dissipated on August 15th. No damage was reported in Canada related to this storm.

1974–Becky

Hurricane Becky developed off the east coast of Florida on August 28, 1974. Becky developed into an intense category 3 hurricane, containing winds reaching 185 km/h (100 knots). Becky entered the CHC Response Zone on August 29th as a category two hurricane; however, it intensified within the CHC Response Zone to a category three hurricane. Becky remained within the CHC Response Zone for five days. Hurricane Becky dissipated on September 2nd without causing any damage in Canada.

1974–Dolly

Tropical Storm Dolly formed northeast of the Bahamas on September 2, 1974. Carrying winds of 83 km/h (45 knots), Dolly entered the CHC Response Zone on September 4th while at maximum strength but weakened slightly before entering Canadian waters on September 5th. Tropical Storm Dolly dissipated and left the CHC Response Zone on September 6th, and did not impact Canada.

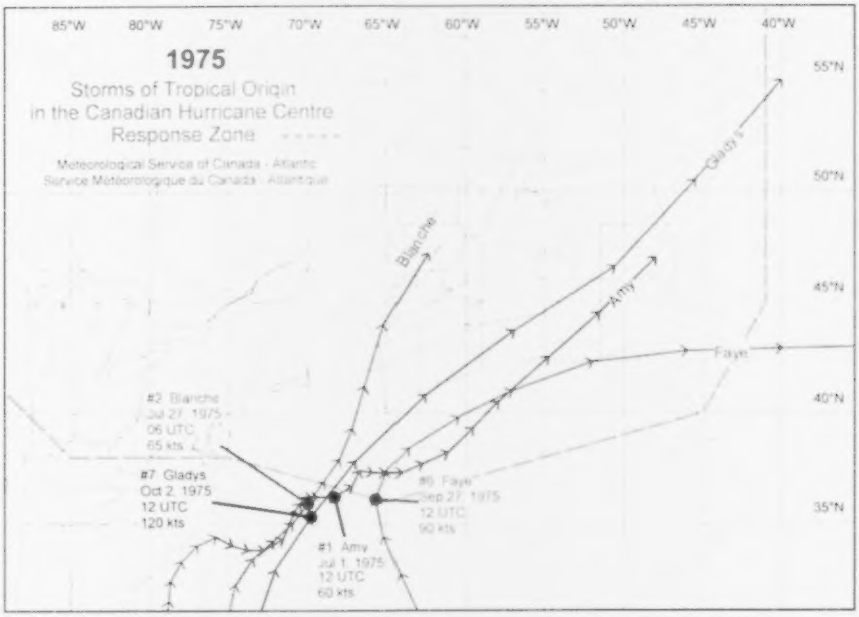
1974–Elaine

On September 4, 1974 Tropical Storm Elaine began east of the Lesser Antilles. While only reaching tropical storm status, Elaine carried winds of 111 km/h (60 knots) at its maximum strength. Upon entering the CHC Response Zone on September 12th Elaine carried winds of 83 km/h (45 knots). Remaining for four days, Elaine left the CHC Response Zone, diminished on September 15th, and did not damage Canada.

1974–Subtrop 4

Subtrop #4 began near the Bahamas on October 4, 1974. Developing into a tropical storm, Subtrop #4 contained winds of 74 km/h (40 knots) when it reached its maximum strength. It entered the CHC Response Zone on October 9th as a tropical depression, with winds of 56 km/h (30 knots). Subtrop #4 dissipated later in the day on October 9th without damaging Canada.

1975 – MAP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1975
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Blanche
Gladys
Amy
Faye
#2 Blanche
Jul 27, 1975
06 UTC
65 kts
#7 Gladys
Oct 2, 1975
12 UTC
120 kts
#1 Amy
Jul 1, 1975
12 UTC
60 kts
#6 Faye
Sep 27, 1975
12 UTC
90 kts

1975–Amy

Amy originated in the Gulf of Mexico on June 27, 1975. Amy only developed tropical storm strength with winds of 110 km/h (60 knots). It entered the CHC Response Zone on July 1st at it maximum strength, entered Canadian waters on the afternoon of July 3rd carrying winds of 93 km/h (50 knots) before passing 240 km (150 mi) southeast of Cape Race, Newfoundland. On July 4th Amy lost its tropical characteristics and diminished without impacting land.

NEWFOUNDLAND

July 4, 1975

- Weakened considerably and moved out over sea, bringing only light rain and fog to St. John's (ET)

1975–Blanche

Hurricane Blanche made landfall near Shelburne, Nova Scotia as a category one hurricane on the morning of July 28th with winds of 130 km/h (70 knots). Blanche also made landfall over Prince Edward Island as a tropical storm with winds of 111 km/h (60 knots) on July 28th.

Blanche formed north of the Bahamas on July 24, 1975. The storm grew in intensity to a category one hurricane with winds of 140 km/h (75 knots). Blanche sustained these storm characteristics upon entering Canadian waters near midnight July 27-28th. It then began to transition into an extratropical storm but still packed winds of 130 km/h (70 knots) when it made landfall later that morning over western Nova Scotia. High winds and very heavy rain were associated with Hurricane Blanche in the Maritimes. Power and telephone lines were knocked down, Air Canada cancelled all flights arriving and departing from Prince Edward Island and ferry services were shut down. The storm became extratropical in the Gulf of St. Lawrence on July 28th.

- Estimate damage costs: *$6.3 million* (CDD)
- Winds of 115 km/h (62 knots) and 120 mm (4.8 in) of rain caused major damages and seven fishing boats were damaged (CDD)

NOVA SCOTIA

July 29, 1975

- Winds gusted up to 130 km/h (70 knots), flattened a half-built slaughterhouse, overturned two mobile homes, snapped trees and downed power lines across Nova Scotia (ET)
- An oil rig moored in the harbour broke loose, threatened and closed the A. Murray Mackay bridge but ran aground safely just short of the bridge (ET)

July 30, 1975

- The costs for damage to the power corporation was estimated to be *$200,000* in Nova Scotia and affected 500 to 1,000 customers (HH)
- Telephone communication was heavily disrupted in Nova Scotia (G)

July 31, 1975

- Halifax measured sustained winds of 83 km/h (45 knots) with gusts to 130 km/h (70 knots) (CHC)
- Western Head, near Cape Sable had sustained winds of 87 km/h (47 knots) (CHC)
- All power in Nova Scotia has been restored and clean-up continues (HH)

NEW BRUNSWICK

- As the system was becoming extratropical, Grindstone Island in the Bay of Fundy, reported sustained winds of 110 km/h (60 knots) (CHC)

July 29, 1975

- The greatest accumulation of precipitation was 78 mm (3.1 in) in Chatham (CHC)

PRINCE EDWARD ISLAND

July 29, 1975

- All Air Canada flights to and from Charlottetown were cancelled along with ferry service to Nova Scotia (G)

July 30, 1975

- Telephone communication was disrupted immensely in the province and the Guardian newspaper had production interrupted causing the paper to be delivered late (G)

1975–Faye

Hurricane Faye developed west of the Cape Verde Islands on September 18, 1975. Strengthening into a category two hurricane, Faye brought winds as high as 166 km/h (90 knots) while at its maximum strength. Hurricane Faye entered the CHC Response Zone on September 27th and dissipated on September 29th without damaging Canada.

1975–Gladys

Gladys began in the middle of the Atlantic Ocean just west of the Cape Verde Islands on September 22, 1975. Gladys gained strength and grew to a category four hurricane with winds of 220 km/h (120 knots). It entered the CHC Response Zone at its maximum strength on October 2nd and remained at category 3 strength with winds of 204 km/h (110 knots) as it moved into Canadian waters on October 3rd. Gladys Passed 130 km (80 mi) southeast of Cape Race, Newfoundland, bringing 37 mm (1.4 in) of rain to St. John's (rainfall amounts were low because Gladys was moving very quickly and had very little time to dump much rain on the Island). While it continued within the CHC Response Zone for another two days, Gladys merged with a cold front and became extratropical before diminishing on October 4th.

NEWFOUNDLAND

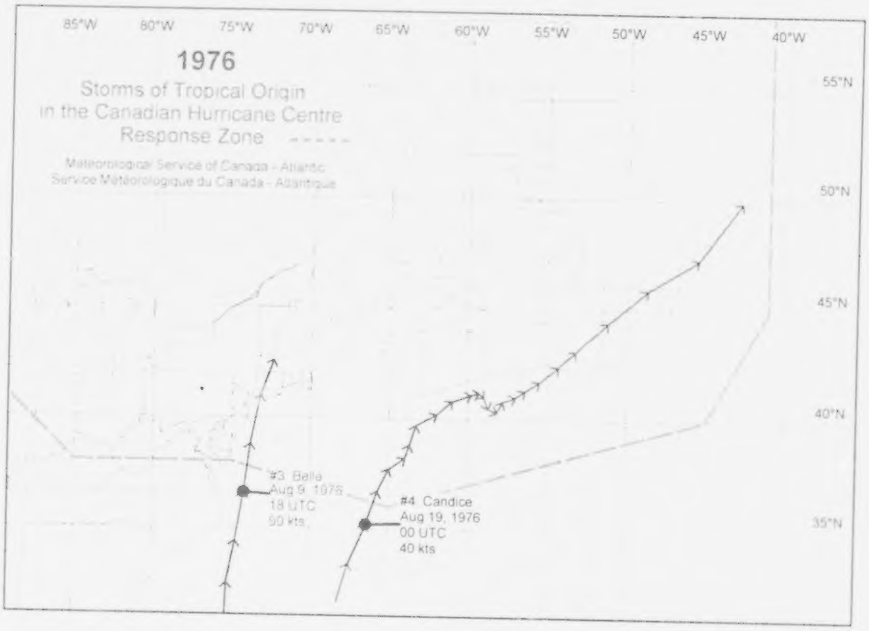
October 4, 1975

- St. John's received 37 mm (1.4 in) of rain, no other damage to report (ET)

1975–Hallie

Tropical Storm Hallie began on October 24, 1975 off the east coast of Florida. Only reaching Tropical Storm status, Hallie contained winds of 83 km/h (45 knots) at its strongest point. Hallie entered the CHC Response Zone and dissipated on October 28th without resulting in any damage.

1976 – MAP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1976
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#3 Belle
Aug 9, 1976
18 UTC
90 kts.
#4 Candice
Aug 19, 1976
00 UTC
40 kts

1976–Subtrop 1

Subtrop #1 began on May 21, 1976 in the Gulf of Mexico. The storm contained winds reaching 83 km/h (45 knots) during its maximum strength. These winds classified the storm as a tropical storm. Subtrop #1 entered the CHC Response Zone and dissipated on May 25th without having caused any damage in Canada.

1976–Belle

Belle originated just north of the Bahamas on August 6, 1976. It gained a maximum strength of a category three hurricane with winds of 194 km/h (105 knots). Belle was a category one hurricane with winds of 150 km/h (80 knots) when it entered the CHC Response Zone on August 10th. Nova Scotia and New Brunswick both felt the effects of Hurricane Belle. Fredericton and Edmundston received heavy rain that raised the Saint John River significantly. Many houses and streets were flooded making travel difficult.

The hurricane only lasted within the CHC Response Zone for half a day before it diminished.

- In Fredericton, rain accumulated to 178 mm (7.1 in) in a three day period and the Saint John River rose 4.9 m (16 ft) (CDD)
- Reports of flooded basements, overloaded sewers, washout roads and culverts in 13 communities in Quebec and New Brunswick (CDD)
- Estimated damage costs: *$6.5 million* (CDD)

NOVA SCOTIA

August 10, 1976

- In Yarmouth, the *Lion* ferry cancelled it's scheduled run and the Portland ferry was delayed (HH)

NEW BRUNSWICK

August 11, 1976

- Hurricane warnings downgraded to storm advisories for the Maritimes (MG)
- Bay of Fundy was hardest hit (MG)

August 12, 1976

- Unofficial estimates of 200 mm (7.9 in) of rain over three days in Edmundston (TJ)
- Traffic was halted on Avenues 47 through 50 off Victoria Street, in Saint John (TJ)
- Route 14 between Edmundston and St. Basile was cutoff (TJ)
- Many other minor roads were washed out and minor flooding occurred (TJ)

1976–Candice

After beginning southwest of Bermuda on August 18, 1976 Hurricane Candice developed into a category one hurricane within the CHC Response Zone. It entered the CHC Response Zone on August 19th and took 4 days to reach Canadian waters, strengthening during that time to 148 km/h (80 knots).Candice dissipated on August 24th, but did not result in any damage reported in Canada.

1976–Subtrop 2 † (1 Canadian fatality)

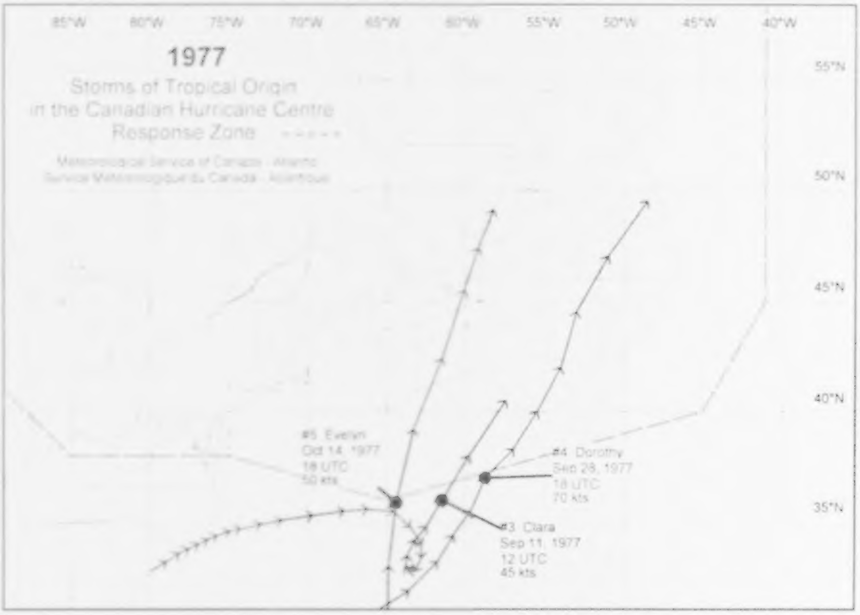
On September 2, 1976 Subtrop #2 developed in the Gulf of Mexico just off the Florida coast. It achieved tropical storm status with winds of 75 km/h (40 knots). Subtrop #2 diminished just before entering the CHC Response Zone on September 17th; however its remnants still had some affects on the Ontario region. **One man was killed in a motorcycle accident,** while dozens of other automobile accidents occurred due to rain and poor visibility. Power outages were also reported.

ONTARIO

September 18, 1976

- A motorcyclist was killed due to poor visibility and rain in Metro Toronto (TS)
- Approximately 53.5 mm (2.1 in) of rain fell (TS)
- Dozens of minor auto accidents and several hundred homes lost power (TS)

1977 – MAP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1977
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#5 Evelyn
Oct 14, 1977
18 UTC
50 kts
#4 Dorothy
Sep 28, 1977
18 UTC
70 kts
#3 Clara
Sep 11, 1977
12 UTC
45 kts

1977–Clara

On September 5, 1977, tropical depression Clara was located just north of Charleston, South Carolina. Clara became a category one hurricane with winds of 120 km/h (65 knots). Clara headed due east before making a 'loop-du-loop' south, then headed northeast passing east of Newfoundland on September 12th. Only wind damage was reported in Antigonish, Nova Scotia. Clara exited the CHC Response Zone as a weak low on September 13th.

NOVA SCOTIA

September 16, 1977

- 100 km/h (54 knots) winds in Antigonish (HH)
- The storm overturned campers, uprooted trees, damaged barns and caused power outages in Antigonish (HH)

1977–Dorothy

On the afternoon of September 25, 1977, a low pressure system developed and became Tropical Depression Dorothy on September 26th. Dorothy formed north of the Bahamas and east of Florida. Hurricane Dorothy had a maximum storm strength estimated at 980 mb (28.9 in) and maximum winds of 138 km/h (75 knots) on September 28th. The hurricane entered Canadian waters on the morning of September 29th and then passed east of the Avalon Peninsula in Newfoundland and caused flight cancellations. The remnants were absorbed by a frontal low pressure system and the storm dissipated on September 30th.

NEWFOUNDLAND

September 30, 1977

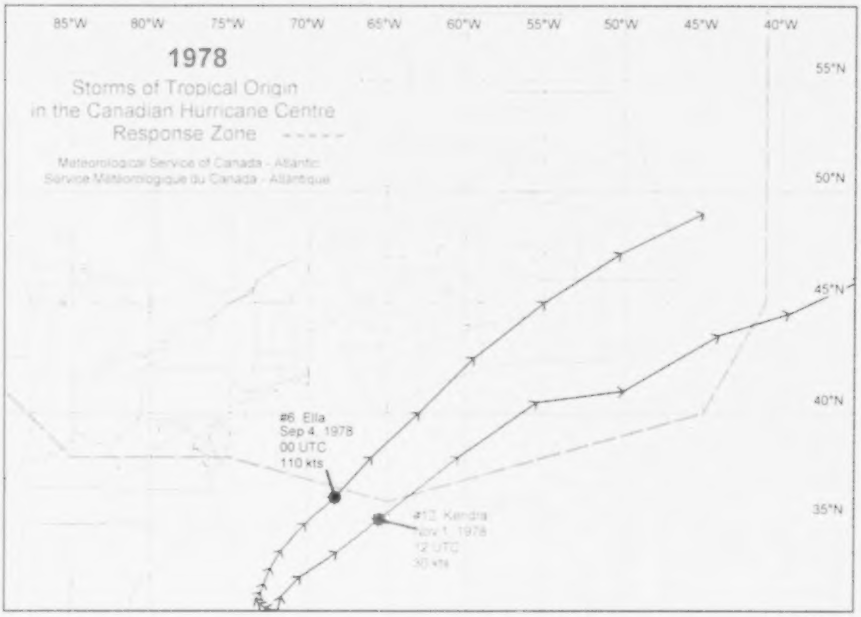
- Air Canada and Eastern Provincial Airways cancelled all flights in Newfoundland (ET)

1977–Evelyn

On October 15, 1977, Evelyn passed over southeastern Cape Breton, Nova Scotia and then on to southwestern Newfoundland near Port aux Basques. Winds attained speeds of 130 km/h (70 knots) for this category one hurricane at both provincial landfalls.

Hurricane Evelyn had its origin as a tropical wave that interacted with an upper level cold low on October 12, 1977, south of Bermuda, in the North Atlantic. An intense non-tropical storm to the west was paralleling Evelyn's track on October 13th. Even after this front was merging with the storm, the storm maintained hurricane-strength winds of 130 km/h (70 knots) as it entered Canadian waters near midnight October 14-15th, and as it crossed over eastern Cape Breton and southwestern Newfoundland that morning and afternoon. The storm weakened rapidly as it crossed western Newfoundland, and no reports of damage or casualties were received. Evelyn left Canadian waters on October 18th.

1978 – MAP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1978
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#6 Ella
Sep 4, 1978
00 UTC
110 kts
#12 Kendra
Nov 1, 1978
12 UTC
30 kts

1978–Ella

On August 28, there was a cyclonic turning of low-cloud elements 925 km (575 mi) southeast of Bermuda and Hurricane Ella formed officially on August 30, 1978. **Ella entered Canadian waters near noon September 4th when it underwent tremendous acceleration in forward speed and when it was also at its maximum strength of 222 km/h (120 knots), making this the strongest recorded hurricane in Canadian waters.** The storm passed very close to the southeast tip of Newfoundland on September 4th while it was at category 3 strength and subsequently became extratropical as it combined with a frontal system over the North Atlantic. Winds were as high as 115 km/h (62 knots) in Newfoundland, but no damage was reported. Ella continued her trek northeastward and exited the CHC Response Zone on the evening of September 5th.

NOVA SCOTIA

September 5, 1978

- Many boats returned to port as a precaution in Nova Scotia (HH)

NEWFOUNDLAND

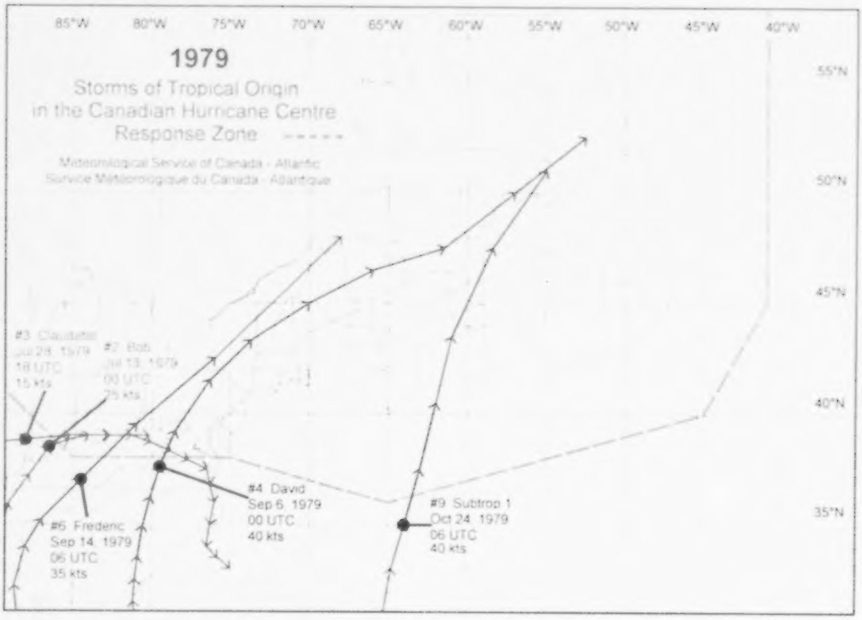
September 5, 1978

- Winds of 115 km/h (62 knots) at Cape Race (ET)
- 45 mm (1.8 in) of rain and winds of 57 km/h (31 knots) at St. John's (ET)
- Many boats returned to port as a precaution in Newfoundland (HH)
- Delayed the departure of the ferry from Nova Scotia to Newfoundland (HH)
- No reports of damage in Newfoundland (ET)

1978–Kendra

A depression developed just east of the Bahamas on the afternoon of October 28, 1978. This depression became Kendra and it reached hurricane status by the afternoon of October 29th. This category one hurricane produced winds of 130 km/h (70 knots). In the CHC Response Zone, winds were 74 km/h (40 knots) when it entered on November 1st. In the end, another extratropical low over the northeast North Atlantic finally absorbed the system and no impact would be felt in Canada. Kendra remained well south of any land and departed Canadian waters on November 2nd.

1979 – MAP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1979
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#3 Claudette Jul 28, 1979 18 UTC 15 kts
#2 Bob Jul 13, 1979 00 UTC 25 kts
#4 David Sep 6, 1979 00 UTC 40 kts
#6 Frederic Sep 14, 1979 06 UTC 35 kts
#9 Subtrop 1 Oct 24, 1979 06 UTC 40 kts

1979–Bob

A depression formed in the southwest Gulf of Mexico on July 9, 1979, and began moving northeastward. Bob developed into a hurricane with maximum winds of 120 km/h (65 knots). Bob moved inland and entered the CHC Response Zone near Ohio on July 13th as a tropical depression with winds of 46 km/h (25 knots). Bob dissipated on July 14th before reaching Ontario and no impacts were felt.

1979–Claudette

On July 16, 1979, a surface circulation first became evident about 830 km (515 mi) east of the Leeward Islands. The following morning, the depression was upgraded to Tropical Storm Claudette. Claudette was a tropical storm for two brief periods separated by a five day interval during which it weakened to a disorganized tropical wave. Claudette left the African coast as the strongest wave of the year. Claudette attained winds of 83 km/h (45 knots) and moved well inland of the United States. On July 29th, the storm dissipated south of Cape Hatteras and had no effect on Canada.

1979–David

David made landfall over New Brunswick, Prince Edward Island and Quebec as a tropical storm with winds of 93 km/h (50 knots) on September 7th. David also made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on September 7th.

David was a typical Cape Verde-type hurricane that moved steadily across the Atlantic and into the Caribbean Sea. Intensification proceeded at a steady pace from the depression, which developed 2,400 km (1,490 mi) east of the Lesser Antilles on August 25th, to a severe hurricane, centred south of Puerto Rico. Maximum winds were 269 km/h (145 knots). The storm weakened only slowly before losing tropical characteristics over New York State and the extratropical low continued to bring strong winds all the way to the Canadian Maritime Provinces. David entered the CHC Response Zone on September 6th and then moved into New Brunswick near midnight that night with maximum winds of 102 km/h (55 knots). David quickly exited the CHC Response Zone on September 8th.

NEW BRUNSWICK

September 7, 1979

- Hall's Creek area most affected by David, causing *$1.194 million* of damage (CDD)

1979–Frederic

Frederic made landfall over New Brunswick and Quebec as a tropical depression with winds of 55 km/h (30 knots) on September 14th.

On August 29, 1979, tropical depression Frederic had formed from a tropical wave off the West African coast south of the Cape Verde Islands. As a category one hurricane, winds produced were 120 km/h (65 knots). Frederic tracked through the inland portions of the eastern United States and entered Canada on September 14th as a weakening tropical depression. Flooding in Quebec and Ontario was the main source of damage. Frederic left the CHC Response Zone on the morning of September 16th.

September 16, 1979

- Little damage in the Maritimes except some broken power poles and windows (TS)

ONTARIO

September 14, 1979

- Seven car pile up on Eglinton Street in Toronto was caused by the storm, no serious injuries (TS)
- Accident on the parkway caused two people to be sent to the hospital in Toronto (TS)

September 16, 1979

- Flooded streets in Cornwall, where 150 mm (5.9 in) of rain fell (TS)
- Flooding in eastern Ontario and part of Niagara Peninsula (TS)

QUEBEC

- Damage cost in southern Quebec *$8.238 million* (CDD)

September 15, 1979

- Record rainfall of 77.2 mm (3 in) fell in seven hours at the McGill Observatory (MG)
- Cancelled a Montreal Expos baseball game (MG)
- Flooded Montreal streets, basements and underground parking lots (MG)

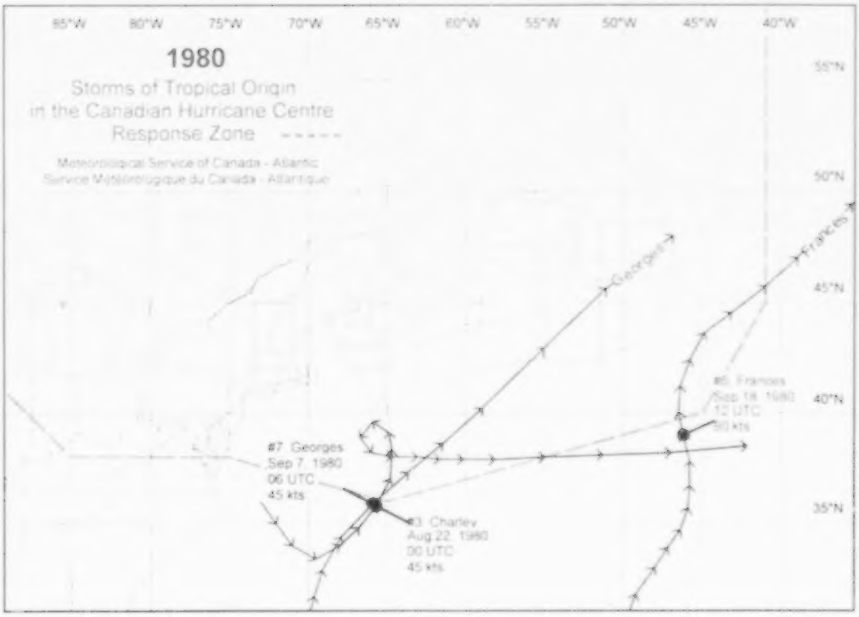
1979–Subtrop 1

Subtrop #1 made landfall over Newfoundland as a tropical storm with winds of 93 km/h (50 knots) on October 25th.

Subtrop #1 formed 320 km (200 mi) south-southwest of Bermuda on October 23, 1979. The storm accelerated during the afternoon of October 24th, while it continued toward the north-northeast, passing south of Nova Scotia through the North Atlantic shipping lanes. The storm entered the CHC Response Zone as a strengthening tropical storm and reached hurricane strength just before moving into Canadian waters on the afternoon of October

24th. The storm then began to lose its tropical characteristics as it passed Sable Island, becoming extratropical as it approached Newfoundland, and merged with a larger extratropical low moving eastward over eastern Canada. Just before dawn on October 25th, the storm made landfall in Newfoundland as a 93-km/h (50-knot) tropical storm. The lowest pressure was estimated to be 980 mb (29.5 in) near Sable Island and the maximum sustained wind was 120 km/h (65 knots). No effects on marine interests were reported and the storm abated on October 25th.

1980 – MAP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1980
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Georges
Frances
#6 Frances
Sep 18 1980
12 UTC
50 kts
#7 Georges
Sep 7 1980
06 UTC
45 kts
#3 Charley
Aug 22 1980
00 UTC
45 kts

1980–Charley

Hurricane Charley began on August 20, 1980 off the coast of North Carolina. It strengthened into a category one hurricane and contained winds of 130 km/h (70 knots). Charley entered the CHC Response Zone on August 22nd at its maximum strength. Remaining within the CHC Response Zone for four days, Charley dissipated on August 25th, and did not cause any damage in Canada.

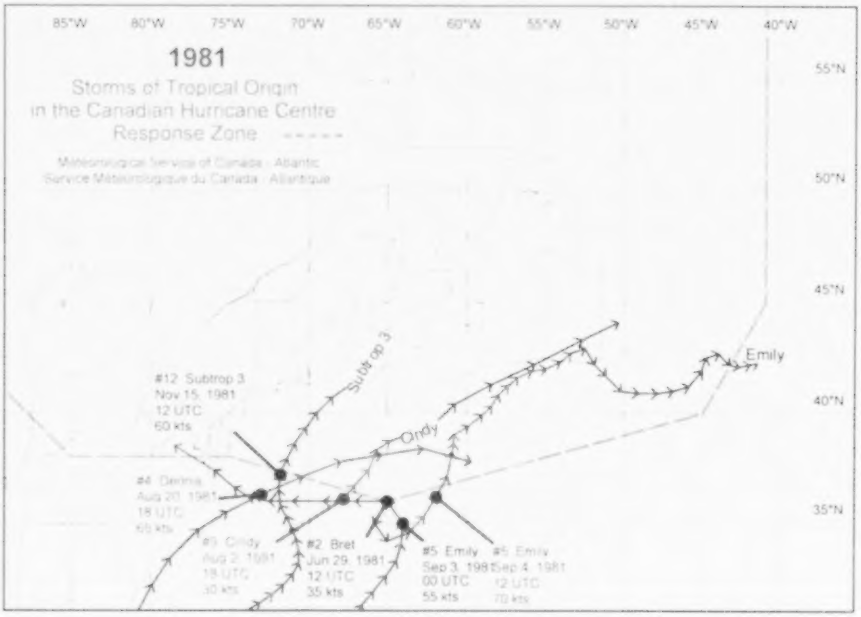
1980–Georges

Hurricane Georges began west of the Cape Verde Islands on September 1, 1980. Georges became a category one hurricane with winds of 130 km/h (70 knots). It entered the southeastern marine district just before midnight on September 8th when it was reaching its maximum strength. Georges left the CHC Response Zone on September 10th without impacting Canada and dissipated the same day.

1980–Frances

Hurricane Frances developed into category three hurricane east of Guinea on September 6, 1980. It contained winds reaching a maximum of 185 km/h (100 knots). While entering the CHC Response Zone on September 18th, it was a category one hurricane and brought winds of 148 km/h (80 knots) to the region. Frances left the CHC Response Zone on September 20th and dissipated on September 21st. No damage reports were located associated with Frances in Canada.

1981 – MAP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1981
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Subtrop 3
Cindy
Emily
#12 Subtrop 3
Nov 15 1981
12 UTC
60 kts
#4 Dennis
Aug 20 1981
18 UTC
65 kts
#3 Cindy
Aug 2 1981
18 UTC
30 kts
#2 Bret
Jun 29 1981
12 UTC
35 kts
#5 Emily
Sep 3 1981
00 UTC
55 kts
#5 Emily
Sep 4 1981
12 UTC
70 kts

1981–Bret

Tropical Storm Bret began on June 29, 1981 west-southwest of Bermuda. Bret developed maximum winds of 111 km/h (60 knots). Bret entered the CHC Response Zone on July 1st as a tropical depression and contained winds at a maximum of 37 km/h (20 knots) within the zone. Bret dissipated on the same day it entered the CHC Response Zone without having impacted Canada.

1981–Cindy

Tropical Storm Cindy developed on August 2, 1981 east of the Carolinas. Cindy gained tropical storm status, however it never transformed into a hurricane with its winds reaching a maximum of 93 km/h (50 knots). It entered the CHC Response Zone on August 3rd as a tropical depression but strengthened to a tropical storm of 83 km/h (45 knots) by the time it entered southeastern marine areas on August 5th. Cindy left the CHC

Response Zone on August 6th, dissipated the same day, and did not result in any damage in Canada.

1981–Dennis

Hurricane Dennis developed south of the Cape Verde Islands on August 7, 1981. While Dennis developed into a category one hurricane, its winds reached a maximum of 130 km/h (70 knots). Dennis sustained its maximum strength as it entered the CHC Response Zone on August 21st. It remained within the CHC Response Zone for about 36 hours before dissipating on August 22nd and did not impact Canada.

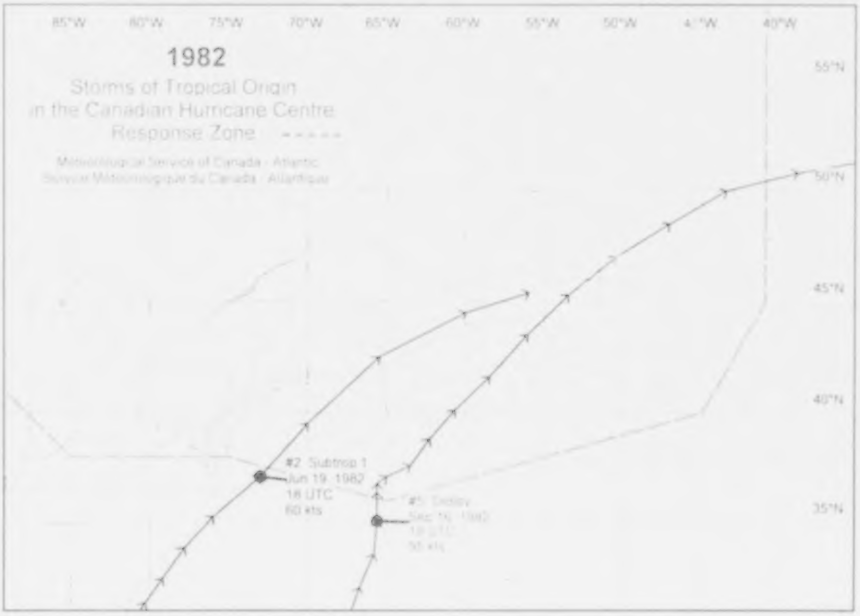
1981–Emily

Hurricane Emily originated off the east coast of Georgia and Florida on August 21, 1981. Emily brought winds reaching as high as 148 km/h (80 knots) making it a category one hurricane. Upon entering the CHC Response Zone on September 4th, Emily was still sustaining winds of 130 km/h (70 knots). Emily continued to track northeast and into the Grand Banks as a marginal category 1 hurricane on September 7th. Emily left the CHC Response Zone September 11th before it dissipated on September 12th and did not damage Canada.

1981–Subtrop 3

Subtrop #3 began on November 12, 1981 east of the Carolinas. The system only developed into a tropical storm however it still contained winds reaching 111 km/h (60 knots). Subtrop #3 entered the CHC Response Zone on November 15th. Upon entering the CHC Response Zone, the system was at its maximum strength. Subtrop #3 moved into southwestern marine area with 93 km/h (50 knots) winds on November 17th but subsequently dissipated the same day, without causing any damage reported in Canada.

1982 – MAP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35°N
1982
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2 Subtrop 1
Jun 19 1982
18 UTC
60 kts
#5 Debby
Sep 16 1982
18 UTC
55 kts

1982–Subtrop 1

On June 18, 1982, a weather disturbance in the Gulf of Mexico, moved rapidly towards the northeast across northern Florida as a developing subtropical storm. Subtrop #1 bypassed the United States mid-Atlantic coastline on June 19th and continued to move northeast, entering southwestern Maritime waters with winds of 111 km/h (60 knots), passing south of Nova Scotia on June 20th. Subtrop #1 achieved a maximum wind speed of 111 km/h (60 knots). The storm paralleled the Nova Scotia and Newfoundland coasts, but caused no major damages. Subtrop #1 left the CHC Response Zone on the evening of June 21st.

NEWFOUNDLAND

June 21, 1982

- Delayed the trip of a man trying to sail across the Atlantic solo from St. John's (ET)

June 22, 1982

- Damaged cod traps along the southern shore of Newfoundland (ET)
- Two fishing boats were lost in Pouch Cove and Flatrock (ET)

1982–Debby

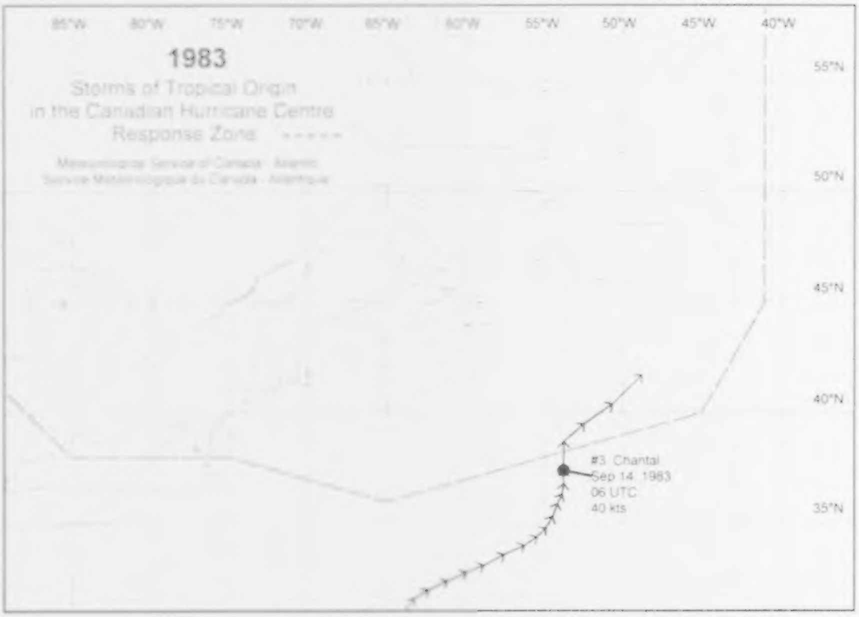
On September 13, 1982, Debby began as an organized centre appearing just north of the Dominican Republic. The hurricane continued to strengthen and reached maximum wind speeds of 213 km/h (115 knots). Debby entered southeastern waters as a category 3 hurricane with winds 204 km/h (110 knots) on September 18th then passing just southeast of Cape Race, Newfoundland later that evening, causing heavy rainfall across southeastern Newfoundland for several hours. The weakening storm departed the CHC Response Zone on September 20th.

NEWFOUNDLAND

September 20, 1982

- Some oil rigs off Newfoundland were evacuated for safety reasons (ET)
- Science expedition off Grand Banks was cut short (ET)
- No damage to oil rigs (ET)

1983 – MAP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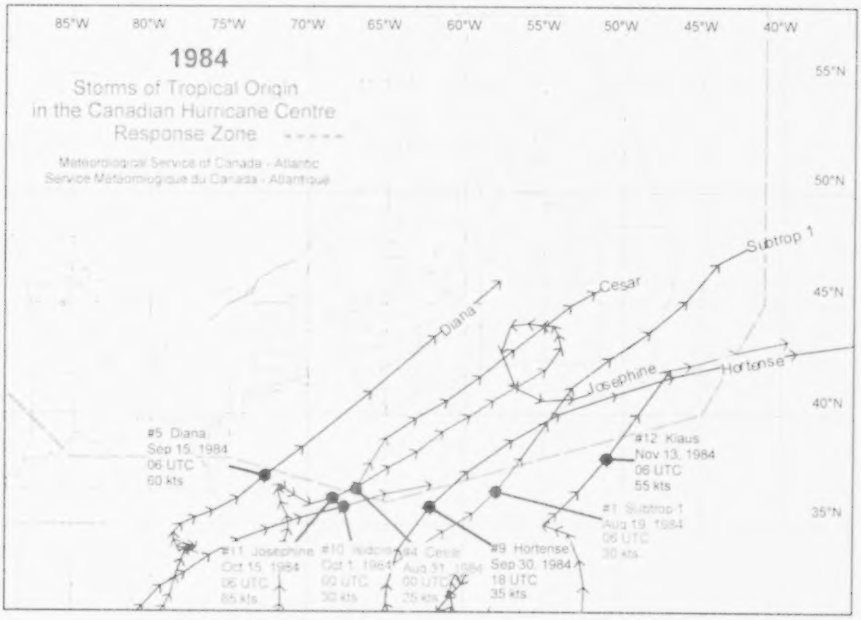
40°W
1983
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
55°N
50°N
45°N
40°N
35°N
#3 Chantal
Sep 14 1983
06 UTC
40 kts

1983–Chantal

Hurricane Chantal originated south of Bermuda on September 10, 1983. Chantal developed into a category one hurricane, with winds reaching as high as 120 km/h (65 knots). However, as Hurricane Chantal entered the CHC Response Zone on September 14th it had weakened into a tropical storm with winds of 64 km/h (35 knots). Only lasting within the CHC Response Zone for one day, Hurricane Chantal dissipated on September 15th and did not result in any damage reported in Canada.

1984 – MAP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40°N
35°N
1984
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Subtrop 1
Cesar
Diana
Josephine
Hortense
#5 Diana Sep 15, 1984 06 UTC 60 kts
#12 Klaus Nov 13, 1984 06 UTC 55 kts
#1 Subtrop 1 Aug 19, 1984 06 UTC 30 kts
#11 Josephine Oct 15, 1984 06 UTC 85 kts
#10 Isidore Oct 1, 1984 00 UTC 30 kts
#4 Cesar Aug 31, 1984 00 UTC 25 kts
#9 Hortense Sep 30, 1984 18 UTC 35 kts

1984–Subtrop 1

Subtrop #1 began as a subtropical depression that formed just north of Bermuda on August 18, 1984. It moved northeast and reached subtropical storm strength by August 19th. The storm reached maximum wind speeds of 93 km/h (50 knots). Subtrop #1 continued to move northeastward off the US coast and into the mid-Atlantic. The storm remained well offshore of Newfoundland, just clipping the outer Grand Banks on August 20th, causing little, if any, damage. The low pressure system exited the CHC Response Zone on the morning of August 21st.

NEWFOUNDLAND

August 22, 1984

- Winds of 100 km/h (54 knots) hit the southwest coast (ET)
- 55 mm (2.2 in) of rain was measure at a local weather office (ET)
- Delayed the ferry departure from Port aux Basques (ET)

1984–Cesar

Tropical Storm Cesar was named on August 31, 1984 when it was centred east of Cape Hatteras, midway between Bermuda and Nova Scotia. Cesar reached maximum wind speeds of 93 km/h (50 knots). By September 2nd, Cesar merged with an extratropical low pressure system to the east of Newfoundland. The storm persisted east of Newfoundland and left the CHC Response Zone on September 4th with no damages reported to Atlantic Canada.

1984–Diana † (1 Canadian fatality)

Diana was named on September 8, 1984 after forming just north of the Bahamas. Diana reached maximum wind speeds of 213 km/h (115 knots). By September 10th, Diana had achieved hurricane strength and was moving north-northeast parallel to the coast of the eastern United States. The storm entered southwestern Maritime waters on the afternoon of September 15th with winds of 111 km/h (60 knots) and then weakened while maintaining its track parallel to Nova Scotia. The storm eventually made landfall over central Newfoundland as an extratropical system. Some damage to ships was reported and Diana departed the CHC Response Zone early on September 17th.

NOVA SCOTIA

September 17, 1984

- Ripped off the mast of the tall ship *Belle Blonde* and washed two crewman over board, one was saved, the other was missing (HH)
- Two oil rigs off Nova Scotia were partially evacuated as a safety precaution (HH)

1984–Hortense

Hortense originated just to the east of Bermuda and was named a tropical storm on September 24, 1984. Hortense attained a maximum wind speed of 120 km/h (65 knots). On September 30th, the storm finally decided to head northeast, where it merged with an extratropical low pressure system in the North Atlantic. The system just barely entered the southern half of the CHC Response Zone on October 1st and left shortly after on October 2nd. No effects in Canada were felt from Hortense.

1984–Isidore

Isidore originated near the southeastern Bahamas on September 25, 1984. Tropical Storm Isidore reached a maximum wind speed of 94 km/h (50 knots). Isidore eventually headed into the mid-Atlantic where the storm lasted until October 1st. It should be noted that Isidore was the last of eight named tropical cyclones to occur in the month of September. This is the most named storms in one month, on record, since 1886. This storm remained in the very southern most section of the CHC Response Zone and did not have any impact on Canada.

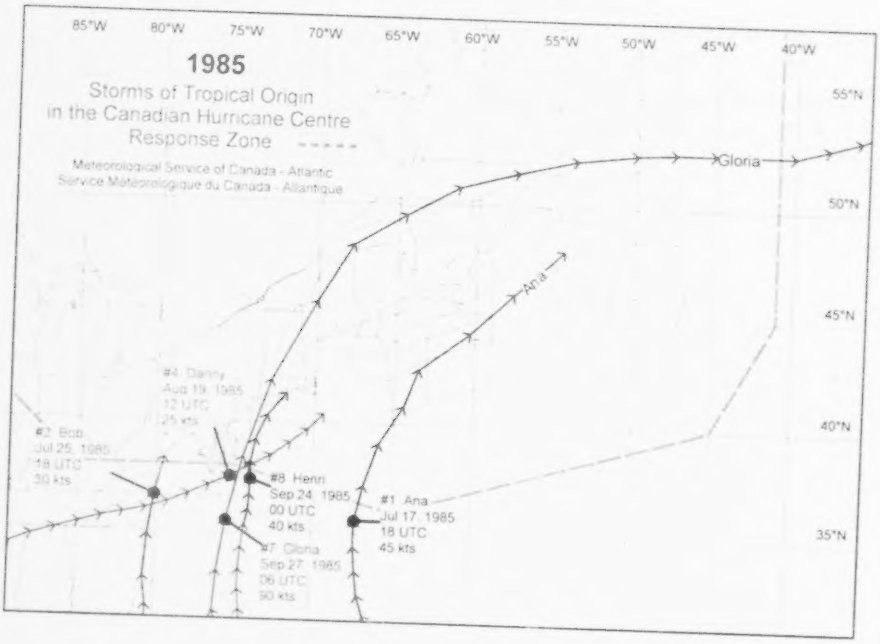
1984–Josephine

Josephine developed as a depression just east of the Bahamas on October 7, 1984. Hurricane Josephine achieved maximum wind speeds of 166 km/h (89 knots). The storm then headed northeast along the North Atlantic shipping lanes. Josephine weakened from October 17th through October 19th, while located about 500 km (310 mi) south of Newfoundland. The storm made a 'loop-de-loop' in southeastern Canadian waters before its remnants headed east-northeast until October 21st.

1984–Klaus

Klaus began south of the Dominican Republic on November 5, 1984. Centred just to the south of Puerto Rico, Klaus was upgraded to a tropical storm on November 6th. Klaus was then located 200 km (120 mi) northeast of Puerto Rico and reached a maximum wind speed of 147 km/h (79 knots). The hurricane then hesitated and weakened, finally merging with an extratropical system on November 13th. Klaus remained well within the southeastern section of the CHC Response Zone and left on November 14th with no apparent effects on Canada.

1985 – MAP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1985
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Gloria
Ana
#4 Danny
Aug 19, 1985
12 UTC
25 kts
#2 Bob
Jul 25, 1985
18 UTC
30 kts
#8 Henri
Sep 24, 1985
00 UTC
40 kts
#1 Ana
Jul 17, 1985
18 UTC
45 kts
#7 Gloria
Sep 27, 1985
06 UTC
90 kts

1985–Ana

Ana made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on July 19th.

Ana originated just south of Bermuda on July 15, 1985. It formed into a tropical storm with maximum winds of 110 km/h (60 knots) and entered the CHC Response Zone on July 18th with winds of 83 km/h (45 knots). Ana made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on July 19th. Newfoundland recorded heavy rain and strong winds. The Burin Peninsula was hit particularly hard as roads were washed away. Ana only remained within the CHC Response Zone for one day before it diminished on July 19th.

NOVA SCOTIA

July 20, 1985

- 50–60 mm (2.0–2.4 in) of rain on Sable Island (ET)

NEWFOUNDLAND

July 20, 1985

- 42 mm (1.7 in) of rain in St. John's and winds of 70 km/h (38 knots) (ET)
- The hardest hit area was the Burin Peninsula with minor road washouts to the highway and St. John's had two overloaded storm sewers (ET)

1985–Bob

Hurricane Bob originated on July 21, 1985 off the west coast of Florida in the Gulf of Mexico. Bob developed into a category one hurricane at its maximum strength. Its winds reached as high as 120 km/h (65 knots). However, Hurricane Bob weakened significantly before entering the CHC Response Zone on June 26th. Upon entry, it was downgraded to a tropical depression. It brought winds as high as 46 km/h (25 knots) to the region. The remnants of Hurricane Bob dissipated on the same day without causing any damage in Canada.

1985–Danny

Hurricane Danny originated on August 12, 1985 near the Greater Antilles. Strengthening into a category one storm, Hurricane Danny contained winds reaching 148 km/h (80 knots). After entering the CHC Response Zone on August 19th, Danny dissipated one day later on August 20th before it could cause any damage in Canada.

1985–Gloria

Gloria made landfall over New Brunswick, Quebec and Labrador as a tropical storm with winds of 93 km/h (50 knots) on September 28-29th.

Gloria began on September 16, 1985 as a disturbance near the Cape Verde Islands. Gloria grew to a category four hurricane with winds of up to 230 km/h (125 knots). It entered the CHC Response Zone on September 27th as a category two hurricane with winds of 160 km/h (85 knots) and weakened rapidly. Gloria made landfall over New Brunswick, Quebec and Labrador as a tropical storm with winds of 93 km/h (50 knots) on September 28-29th. New Brunswick received high winds that knocked out power in Fredericton and St. Stephen. There were also some reports of damage within Nova Scotia. Gloria left the CHC Response Zone on September 30th and dissipated on October 2nd.

Gloria was ultimately responsible for the creation of the Canadian Hurricane Centre.

NOVA SCOTIA

- There was minor wind and wave damage reported in Nova Scotia because of Hurricane Gloria (CHC)

NEW BRUNSWICK

September 28, 1985

- Winds gusted from 83–89 km/h (45–48 knots) and 6.9 mm (0.3 in) of rain fell in Fredericton (TJ)
- Wind knocked down power lines in Fredericton and St. Stephen and 1,800 calls were received about power outages (TJ)
- Weakened very quickly after hitting land and did not cause as much damage as expected (ET)

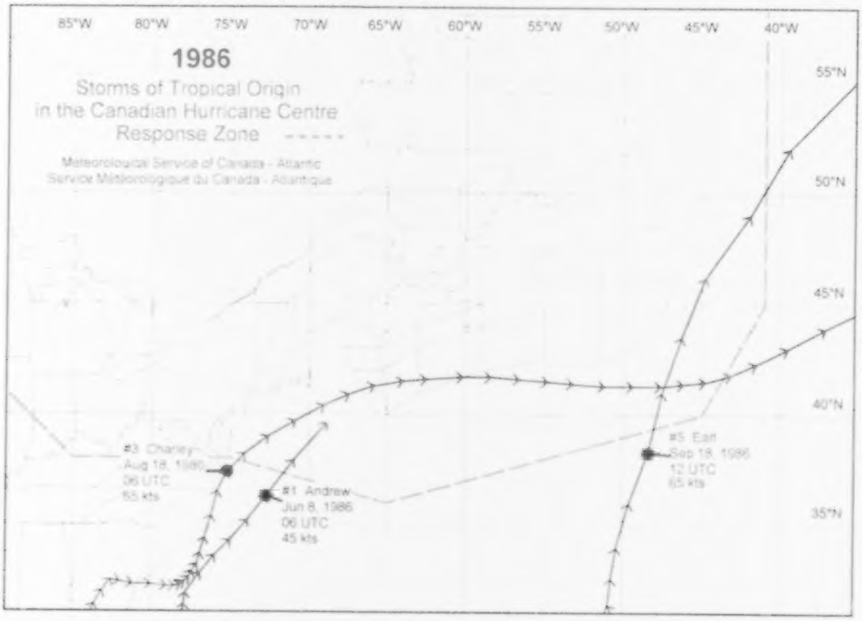
1985–Henri

Tropical Storm Henri began on September 21, 1985 off the east coast of Florida. Henri never reached hurricane status, however it contained winds reaching 92 km/h (50 knots). The storm entered the CHC Response Zone on September 24th and diminished the following day on September 25th without having caused any damage in Canada.

1985–Isabel

Isabel originated on October 7, 1985. After developing off the Dominican Republic coast, Isabel contained winds reaching a maximum of 111 km/h (60 knots); therefore, Isabel only reached tropical storm status. It entered the CHC Response Zone on October 15th, dissipated the same day, and did not cause any damage reported in Canada.

1986 – MAP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1986
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#3 Charley
Aug 18, 1986
06 UTC
65 kts
#1 Andrew
Jun 8, 1986
06 UTC
45 kts
#5 Earl
Sep 18, 1986
12 UTC
65 kts

1986–Andrew

Andrew originated just north of the Bahamas on June 5, 1986. Andrew only developed into a tropical storm and never reached hurricane status. Its winds reached a maximum strength of 83 km/h (45 knots). Tropical Storm Andrew entered the CHC Response Zone and diminished on June 8th without damaging Canada.

1986–Charley † (1 Canadian fatality)

Charley formed in the Gulf of Mexico just off the southeastern United States coast on August 13, 1986. Before entering the CHC Response Zone, Charley achieved category one status with winds of 130 km/h (70 knots) and then weakened to a tropical storm with 110 km/h (60 knots) winds upon entry on August 18th. It continued weakening rapidly and was down to 83 km/h (45 knots) by the time it entered southwestern Canadian waters on August 19th. The storm kept rescue crews busy as one boy was swept into the water in

St. John's and five boats needed to be towed back to safety. Charley left the CHC Response Zone on August 23rd and dissipated a week later on August 30th.

NOVA SCOTIA

August 25, 1986

- A 5 m (16 ft) outboard boat, a second outboard boat, a 11 m (36 ft) boat and a 30 m (98 ft) American fishing vessel all had to be rescued and towed ashore due to high seas in Halifax (HH)

NEW BRUNSWICK

August 25, 1986

- Two sailboats need to be towed to the Saint John harbour after sustaining damage (HH)

NEWFOUNDLAND

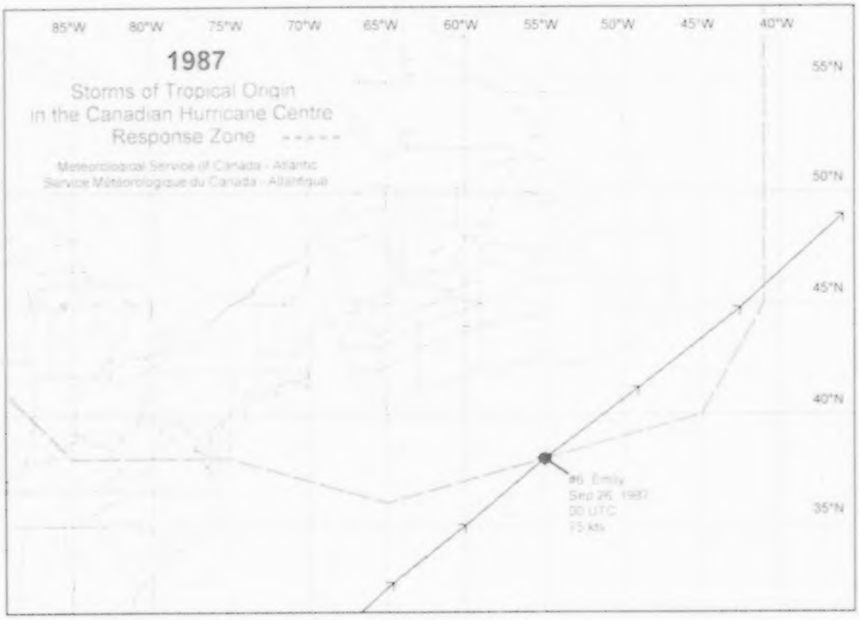
August 25, 1986

- Search and Rescue were combing the water for a 17 year old that was swept off the rocks in St. John's (HH)

1986–Earl

Hurricane Earl began on September 10, 1986 in the Atlantic Ocean. It developed into a category two hurricane and its winds reached as high as 166 km/h (90 knots). Earl entered the CHC Response Zone on September 18th and dissipated on September 20th before it impacted land.

1987 – MAP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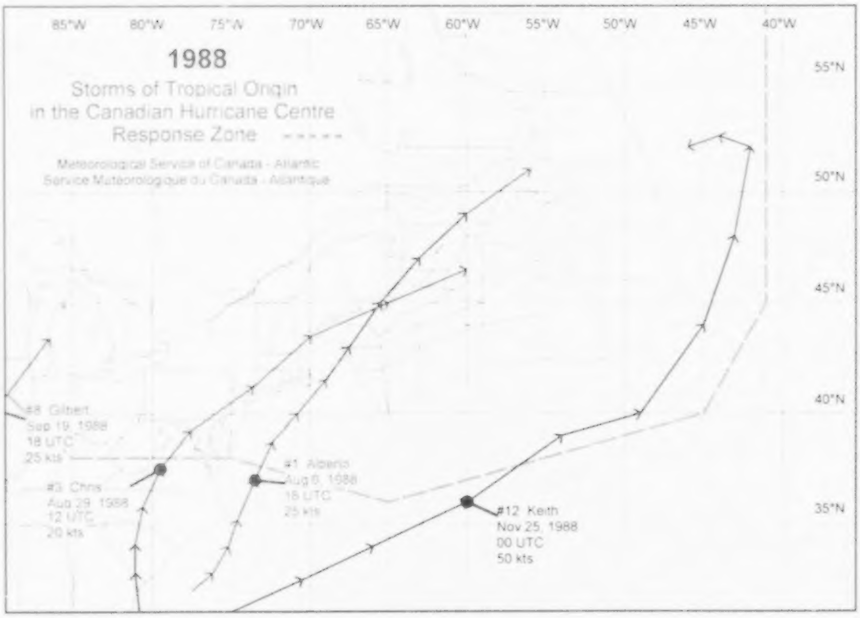
1987
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#6 Emily
Sep 26 1987
00 UTC
75 kts

1987–Emily

Hurricane Emily began on September 20, 1987 southeast of Barbados. It strengthened into a category three hurricane with winds reaching as high as 203 km/h (110 knots). Emily entered the CHC Response Zone on September 26th as a category one hurricane. At this point, the system was weakening and contained winds of 129 km/h (70 knots). Emily dissipated that same day and did not result in any damage in Canada.

1988 – MAP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1988
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#8 Gilbert
Sep 19, 1988
18 UTC
25 kts
#3 Chris
Aug 29, 1988
12 UTC
20 kts
#1 Alberto
Aug 6, 1988
18 UTC
25 kts
#12 Keith
Nov 25, 1988
00 UTC
50 kts

1988–Alberto

Alberto made landfall over Nova Scotia, New Brunswick and Prince Edward Island as a tropical storm with winds of 65 km/h (35 knots) on August 7-8th. Alberto also made landfall over Newfoundland as a tropical depression with winds of 55 km/h (30 knots) on August 8th.

The 1988 season's first named storm formed on August 5, 1988 off the coast of South Carolina. Alberto reached maximum wind speeds of 64 km/h (34 knots). Upon entering the CHC Response Zone on August 7th, the storm weakened to a tropical depression shortly after. Yarmouth, Nova Scotia had gusts of 78 km/h (42 knots) and Saint John, New Brunswick had 45.1 mm (1.8 in) of rain. On the evening of August 8th, the weakened storm left the CHC Response Zone.

NEWFOUNDLAND

August 8, 1988

- No damage in Newfoundland (ET)

1988–Chris

Chris made landfall over Nova Scotia as a tropical depression with winds of 46 km/h (25 knots) on August 30th.

Chris formed as a tropical depression on August 21, 1988 while halfway in between Africa and the Lesser Antilles. During this time, the depression was upgraded to Tropical Storm Chris, reaching maximum wind speeds of 81 km/h (44 knots). Chris was an extratropical storm by the time it was in Canadian waters and maximum winds were 46 km/h (25 knots). The Maritimes experienced heavy rain from Chris. The dying depression dissipated in the CHC Response Zone on the evening of August 30th.

1988–Gilbert

Hurricane Gilbert formed into a tropical depression on September 8, 1988 while just east of the Lesser Antilles and was upgraded to a tropical storm late on September 9th. Gilbert reached maximum wind speeds of 299 km/h (161 knots). Gilbert weakened after moving inland and recurved across Texas and Oklahoma where it merged with a frontal low pressure system. The storm continued to weaken to a tropical depression with winds of 46 km/h (25 knots) and entered the CHC Response Zone near Lake Michigan. On September 20th, Gilbert dissipated before reaching Ontario and had no effects on Canada.

1988–Keith

As the last tropical storm of the season, Keith developed into a tropical depression on November 17, 1988, while located in the western central Caribbean. Keith reached a category one hurricane with maximum wind speeds of 120 km/h (65 knots) and headed northeast through the Atlantic. Keith remained near the eastern border of the CHC Response Zone as a tropical storm during its lifetime in the area from November 25th to 28th. Keith caused a freighter to sink off Sable Island and some scattered power outages occurred in Labrador.

NOVA SCOTIA

November 25, 1988

- 27 sailors were rescued from the sinking freighter the *Katia* 360 km (225 mi) southeast of Sable Island (ET)

NEWFOUNDLAND AND LABRADOR

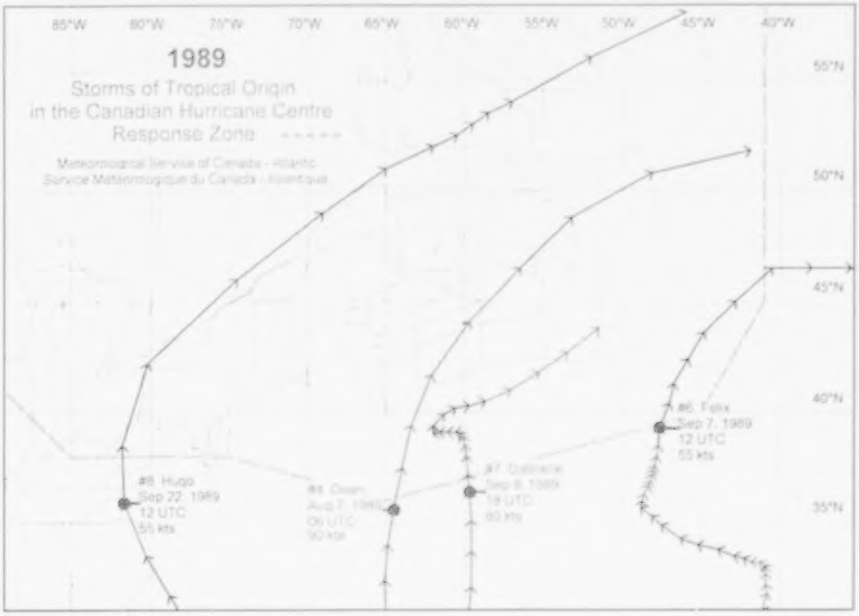
November 25, 1988

- Delayed oil refinery production in Placentia Bay (ET)

November 26, 1988

- Power was lost along the northeast coast of Labrador in Rigolet, Hopedale, and Makkovik (ET)

1989 – MAP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1989
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#8 Hugo
Sep 22, 1989
12 UTC
55 kts
#4 Dean
Aug 7, 1989
06 UTC
90 kts
#7 Gabrielle
Sep 8, 1989
18 UTC
60 kts
#6 Felix
Sep 7, 1989
12 UTC
55 kts

1989–Dean

Dean made landfall over Newfoundland as a tropical storm with winds of 102 km/h (55 knots) on August 8th.

Originating on July 31, 1989 off the northwest coast of Africa as a tropical wave, Hurricane Dean swirled into a category two hurricane bringing winds as high as 166 km/h (90 knots). Dean entered southern Maritime waters on August 7th as a category 1 hurricane with winds of 148 km/h (80 knots). Dean brought winds of 120 km/h (65 knots) and gust of 142 km/h (77 knots) to Sable Island. Dean continued to travel towards southeastern Newfoundland and developed into an extratropical system. There were no significant reports of damages or power interruptions. Hurricane Dean diminished on August 9th.

NEWFOUNDLAND

August 9, 1989

- Winds at 80 km/h (43 knots) whipped the south coast and they received about 35 mm (1.3 in) of rain (ET)
- The storm made landfall at Harbour Breton and then passed through to Bonavista (ET)
- Heavy winds were reported to the east of the storm while most of the rain fell to the west side (ET)
- No power interruptions were reported (ET)

1989–Felix

Hurricane Felix began on August 26, 1989 off the African coast and continued until September 10th. Strengthening into a category one hurricane, Felix contained 138 km/h (75 knots) winds. Hurricane Felix was a persistent storm, developing into a hurricane, weakening, and then reforming again into a hurricane. Traveling through the CHC Response Zone from September 7th to September 9th, Hurricane Felix remained at sea, causing no impact on Canada.

1989–Gabrielle † (1 Canadian fatality)

Hurricane Gabrielle developed into a category four hurricane after originating off the Cape Verde Islands on August 30, 1989. Gabrielle carried strong winds, reaching a maximum of 231 km/h (125 knots). Upon entering the CHC Response Zone on September 9th, Gabrielle was downgraded to a category one hurricane, with winds 138 km/h (75 knots). Gabrielle created very heavy seas off the coast of Nova Scotia, sending ships running for shelter, **sweeping one man into the water, and costing him his life.** Hurricane Gabrielle dissipated shortly after entering the Grand Banks on September 13th.

NOVA SCOTIA

September 11, 1989

- Two men walking along the shore at Gill Cove were sent into the water by a wave. One man was tossed ashore by the next wave and uninjured, however the other man was lost and drowned (HH)
- Wave heights were reported to be at 12 m (40 ft), and very heavy swells were just offshore (HH)
- The Shearwater wave-rider buoy was reporting swells of 7.3 m (24 ft) and it earlier reported a height of 9.2 m (30 ft) (HH)
- Two-story high waves were crashing against the coast (HH)

NEWFOUNDLAND

September 9, 1989

- 20 ships (including 12 Portuguese) found shelter in St. John's harbour as Hurricane Gabrielle tossed up seas (ET)

1989–Hugo

Hugo made landfall over Ontario, Quebec and Labrador as a tropical storm with winds of 65 km/h (35 knots) for Ontario and 74 km/h (40 knots) for Quebec and Labrador on September 23rd.

Hurricane Hugo began on September 10, 1989 off the coast of Africa and developed into a category five hurricane. Its winds reached a powerful 259 km/h (140 knots) during its maximum strength. Hugo entered Canada through Ontario on September 23rd at marginal tropical storm strength as it transformed into an extratropical storm. It brought winds of 74 km/h (40 knots) to the CHC Response Zone. Hugo created havoc with power lines, trees, and signs in several eastern provinces. Hurricane Hugo lasted for 15 days before it finally diminished on September 25th.

ONTARIO

September 23, 1989

- 60–70 km/h (32–38 knots) winds were felt in the Niagara Falls region (TS)
- The storm tracked over central Lake Ontario and passed over Kingston and then over Ottawa (TS)
- 15 neighbourhoods in Toronto were without power during the storm because of fallen wires (TS)

- A street car's overhead wires exploded on King Street and Strachan Avenue causing a blackout in the Toronto area (TS)
- There were also several car accidents throughout Toronto, mostly fender benders (TS)

September 24, 1989

- Metro Toronto received 47.2 mm (1.8 in) of rain on Bloor Street and winds were gusting to 75 km/h (41 knots) (TS)
- High winds and heavy rain were also present in southern Ontario (ET)

QUEBEC

September 24, 1989

- 11 mm (0.4 in) of rain fell on the Montreal area and was accompanied with wind gusts of 95 km/h (51 knots) (MG)
- High winds caused no significant damage to Montreal; however power was lost to some 13,400 homes in the area (MG)
- In Verdun and West Island, 7,400 customers were without power from midnight till noon due to branches falling on power lines. While in Brossard and Chambly power was lost to 5,000 homes and 1,000 homes in Valleyfield (MG)
- High winds and heavy rain were reported in the St. Lawrence Valley (ET)

NEW BRUNSWICK

September 25, 1989

- 124 km/h (67 knots) winds were recorded in Moncton (TJ)
- Power outages were reported to about 15,000 customers in New Brunswick. Falling branches and poles caused most of these power failures (TJ)
- In Saint John and Moncton, trees and signs were blown down, but no serious damage or injuries were reported (TJ)
- New Brunswick Power reported that 4,000 homes in Fredericton, 3,000 homes in Moncton and Chatham, and 2,000 homes in Sussex were affected by outages (TJ)

September 27, 1989

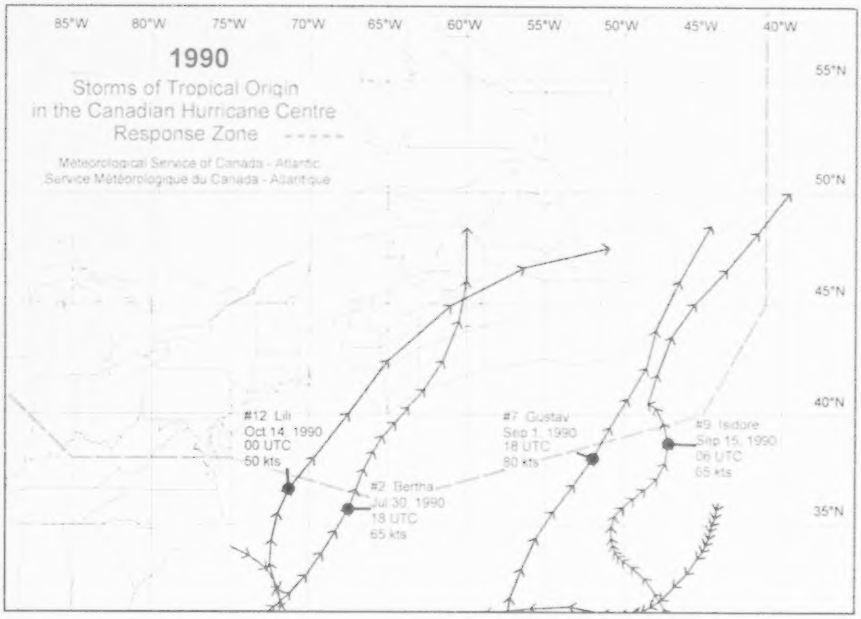
- Hugo's winds hurt New Brunswick apple growers by blowing apples off the trees onto the ground, and those apples lost their value as they are only used for juice (TJ)

NEWFOUNDLAND

September 25, 1989

- Strong winds of 70 km/h (38 knots) were measured in St. John's during the weekend (ET)
- Hurricane Hugo passed over Labrador on the weekend resulting in 7 cm (2.8 in) of snow falling on Wabush and rain in southern Labrador (ET)

1990 – MAP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1990
Storms of Tropical Origin in the Canadian Hurricane Centre
Response Zone
Météorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#12 Lili
Oct 14, 1990
00 UTC
50 kts
#2 Bertha
Jul 30, 1990
18 UTC
65 kts
#7 Gustav
Sep 1, 1990
18 UTC
80 kts
#9 Isidore
Sep 15, 1990
06 UTC
65 kts

1990–Bertha

Bertha made landfall as a category one hurricane over southeastern Cape Breton, Nova Scotia on August 2nd at 0530 UTC with winds of 120 km/h (65 knots).

Hurricane Bertha originated near North Carolina on July 24, 1990. Developing into a category one hurricane, Bertha's winds reached a maximum of 129 km/h (70 knots). It remained as a category one hurricane as it entered the CHC Response Zone on July 30th and carried winds of 130 km/h (70 knots) as it entered Canadian waters on the morning of August 1st. Winds remained at this strength as it made landfall over eastern Cape Breton before dawn on August 2nd. Six crewmembers of a cargo ship were lost in the North Atlantic south of Nova Scotia. Heavy rain and high winds that were experienced caused some damage in the Atlantic region. Hurricane Bertha dissipated later on August 2nd. The CHC issued 26 Hurricane Information Statements.

- Estimated Cost of Damage: *$4.427 million* (CDD)
- High surf battered the shoreline with up to 190 mm (7.5 in) of rain (CDD)
- Prince Edward Island's corn and tobacco crops were affected the most (CDD)

- Bertha generated considerable national interest in Canada (CHC)
- Several reports of wind gusts over 110 km/h (59 knots) (CHC)
- Rainfall totals as high as 175 mm (6.9 in) (CHC)
- High surf conditions along the coast of Nova Scotia resulted in several people being washed into the sea; all were rescued (CHC)
- Offshore moored buoys reported seas as high as 15 m (49 ft) (CHC)

NOVA SCOTIA

August 2, 1990

- Six crewmembers of the cargo ship, *Corazon*, sailing 560 km (348 mi) south-southwest of Cape Cod were lost (G)
- 120 km/h (65 knots) winds where reported at Sable Island (G)
- No damage or injuries were reported except at Peggy's Cove, where six people were brought to hospital, when several of them where washed over into the ocean by the large waves. All people were pulled from the ocean but some had injuries ranging from cuts to a sore back (ET)

PRINCE EDWARD ISLAND

August 3, 1990

- 100 km/h (54 knots) winds were reported on the island (G)
- Hurricane Bertha wrecked a greenhouse and flattened both tobacco and corn crops due to heavy rain and high winds in Kings County (G)

1990–Gustav

Hurricane Gustav began on August 24, 1990 off the Lesser Antilles and strengthened into a category three hurricane, bringing winds of 194 km/h (105 knots) at its maximum strength. Hurricane Gustav came into the CHC Response Zone on September 1st, while curving outward into the Atlantic Ocean. It brought winds of 148 km/h (80 knots) as it entered the CHC Response Zone. Hurricane Gustav made no direct impacts on Canada as it passed by and diminished on September 3rd, however, hurricane force winds gusts were reported in the extreme southeastern corner of the Grand Banks. The CHC issued 12 Hurricane Information Statements.

1990–Isidore

Hurricane Isidore formed off the Cape Verde Islands on September 4, 1990 and intensified into a category two hurricane. Winds were recorded to be 157 km/h (85 knots) during the hurricanes maximum strength. On September 15th, Isidore entered the CHC Response Zone with winds of 120 km/h (65 knots), making it a category two hurricane upon entry. Isidore only tracked through the CHC Response Zone for two days, leaving on September 17th and dissipating that same day without having damaged Canada. Storm force winds affected only the extreme southeastern portions of the Grand Banks. The CHC issued 17 Hurricane Information Statements.

1990–Lili

Lili made landfall over Newfoundland as a tropical storm with winds of 74 km/h (40 knots) on October 15th.

Hurricane Lili was formed on October 6, 1990 in the mid-Atlantic Ocean. Moving westward south of Bermuda, Lili developed into a category one hurricane. It continued to track along the east coast, entered the CHC Response Zone as a tropical storm of 93 km/h (50 knots) and passed near Nova Scotia as it transitioned into an extratropical system. The storm made landfall in Newfoundland with winds of 74 km/h (40 knots). After leaving 35 mm (1.4 in) of rain in Newfoundland, Lili dissipated on October 15th. The CHC issued 10 Hurricane Information Statements.

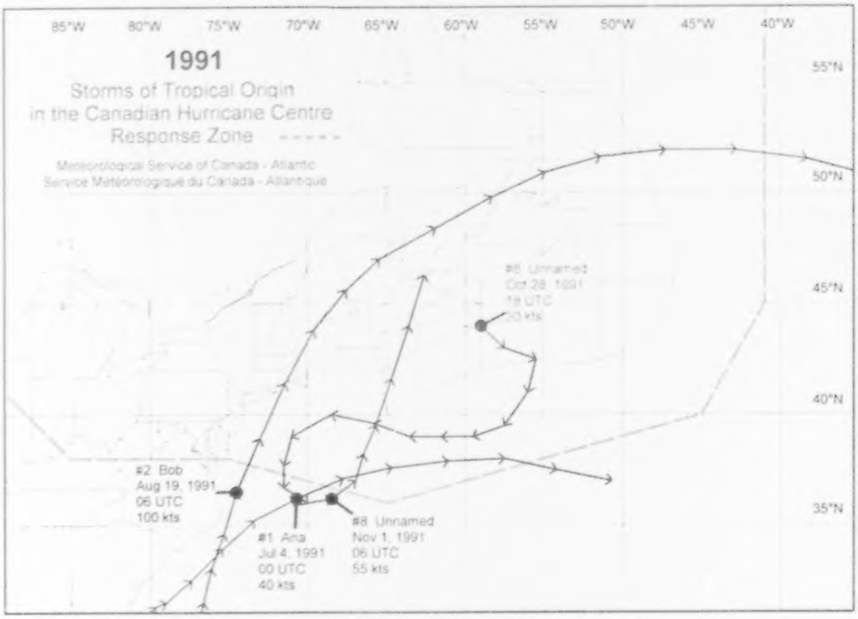
- One Cape Breton station reported 49 mm (1.9 in) of rain in less than six hours (CHC)

NEWFOUNDLAND

October 15, 1990

- 35 mm (1.3 in) of rain fell in 24 hours in St. John's (ET)
- The temperature rose to a high of 18.9°C (66°F) which set a record for St. John's (ET)

1991 – MAP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35°N
1991
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#8 Unnamed
Oct 28, 1991
18 UTC
50 kts
#2 Bob
Aug 19, 1991
06 UTC
100 kts
#1 Ana
Jul 4, 1991
00 UTC
40 kts
#8 Unnamed
Nov 1, 1991
06 UTC
55 kts

1991–Ana

Ana was a storm that developed east of Florida, near the Bahamas on June 29, 1991. Ana gave maximum wind speeds of 81 km/h (44 knots). Ana moved in a northeasterly direction towards the St. Augustine area, before ceasing to exist on July 5th. The storm caused no damage and had no direct impact on Canada.

1991–Bob † (2 Canadian fatalities)

Bob made landfall over New Brunswick as a tropical storm with winds of 111 km/h (60 knots) on August 20th. Bob also made landfall over Newfoundland as a tropical storm with winds of 74 km/h (40 knots) on August 21st.

Hurricane Bob originated just southeast of Bermuda on August 16, 1991. This storm reached maximum wind speeds of 185 km/h (100 knots). Bob entered the CHC Response

Zone on August 19th and continued into Maine, reaching New Brunswick in the early morning hours of August 20th as a strong tropical storm. Bob continued into the Gulf of St. Lawrence waters later that morning. The hurricane proceeded through the central North Atlantic. Bob finally left the CHC Response Zone on August 22nd and dissipated near Portugal on August 29th. Hurricane Bob was responsible for ***$1.5 billion*** in damage (mostly in US) and 18 **deaths, including two in Nova Scotia when two teens were swept out to sea and they were presumed lost**. It also caused power outages in 2.1 million homes. As a result of the storm, strong winds were felt in Atlantic Canada.

NEW BRUNSWICK

August 21, 1991

- 87 mm (3.4 in) of rain fell in northern New Brunswick (TJ)
- Two fishing boats and a pleasure craft capsized at Petit Rocher (TJ)
- Some power outages were reported (TJ)
- In Saint John, the Archway entrance to Seaside Park collapsed (TJ)
- Trees in King Square, Saint John were split in half (TJ)
- Some flights were cancelled in Saint John (TJ)
- *Princess of Acadia* ferry took longer to cross the Bay of Fundy between Digby and Saint John and cancelled one trip (TJ)

August 22, 1991

- ***$1 million*** of damage to 30 weirs off Grand Manan (TJ)

NOVA SCOTIA

August 21, 1991

- Two teens were swept out to sea and presumed drowned off Cape Forchue, Yarmouth (HH)
- 109 km/h (59 knots) winds in Digby (ET)
- Two men were also swept out to sea at Cape Forchue, but were able to make it back to shore (MG)

PRINCE EDWARD ISLAND

August 21, 1991

- No major damage reports (G)
- A few power outages and fallen tree limbs throughout the Island (G)

NEWFOUNDLAND

August 21, 1991

- 59 km/h (32 knots) winds in St. John's (ET)
- Record rainfall of 26 mm (1 in) in St. John's (ET)

1991–Unnamed "Perfect Storm" † (7 Canadian fatalities)

The Unnamed storm—also known as "The Halloween Storm" and "The Perfect Storm"—made landfall over Nova Scotia and Prince Edward Island as a tropical storm with winds of 93 km/h (50 knots) on November 2nd. This was the first storm in which the moored-buoy program off Canada's east coast recorded phenomenal wave heights, including a single wave of over 30 metres.

From prediction through naming, every aspect of this very complex storm challenged forecasters in Canada and the United States. A strong extratropical low formed off the coast of Nova Scotia on October 28, 1991. The low moved southward and developed into an extratropical storm south of Halifax. This storm made a counter clockwise loop and moved northeast through Nova Scotia and Prince Edward Island. Meanwhile, out in the Atlantic on October 29th, a cold front encountered a dissipating Hurricane Grace and the storm weakened quickly. A new circulation was visible on the GOES photographs late on October 29th forming an extratropical low pressure centre. Moisture that was previously associated with Hurricane Grace moved north-northeast and combined with the new low pressure centre. On October 30th, a buoy 425 km (264 mi) south-southeast of Halifax reported a peak wave height of 30.5 m (100 ft). This represented the highest wave height ever measured on the Scotian Shelf. On November 2nd, the storm was declared by the U.S. National Hurricane Centre to be of hurricane strength. By the time it reached the Nova Scotia coast near Halifax, it had weakened rapidly and its maximum sustained winds had diminished to near 93 km/h (50 knots). The storm left the CHC Response Zone on the evening of November 4th. Power outages occurred across Newfoundland and Nova Scotia. This storm also has the distinction of having the northernmost point of origin for any tropical cyclone in the U.S. National Hurricane Center's database for the Atlantic.

Naming This Storm

By the time the tropical system had formed on November 2nd, the extratropical system was on the wane and conditions were improving on the coasts. The Canadian Hurricane Centre and the United States National Hurricane Center felt that naming or renaming this storm would cause major confusion for the media and the public. Meteorologists now refer to this storm as 'The Perfect Storm' (based on Sebastian Junger's book), 'The Unnamed Storm', or 'The Halloween Storm.'

NOVA SCOTIA

October 30, 1991

- Ferry crossings from Yarmouth to Bar Harbour, Maine and from Nova Scotia to Prince Edward Island were cancelled (ET)
- A Liberian bulk carrier southeast of Sable Island was taking in water, engines and electrical systems were knocked out, and the engine room and sleeping quarters were flooded (ET)

November 1, 1991

- 20,000 people in Pictou County were without power (HH)
- Two lobster boats and a whale watching boat destroyed by the high winds in Tiverton (ET)
- Japanese trawler lost power and steering in the North Atlantic, rescued by a fisheries observer who coordinated rescue efforts (ET)

NEWFOUNDLAND

October 29, 1991

- Storm caused slippery roads on the Trans Canada near Grand Falls-Windsor which resulted in a car accident killing one man (ET)
- Wind gusts of 110 km/h (59 knots) reported in St. Lawrence-Lawn Area (ET)
- 11.6 cm (4.4 in) of snow fell breaking the record for October 28th (ET)
- Numerous car accidents on the Burin Peninsula Highway, one person with serious injuries (ET)
- High winds forced several tractor trailers off the road near Hawke's Hill, near Holyrood (ET)
- Power outages on the Burin Peninsula and in the St. Lawrence-Lawn Area (ET)
- Power outages in English Harbour West, Belleoram, Mose Ambrose, Wreck Cove, Boxey and Coomb's Cove (ET)
- Stopped ferry service between Nova Scotia and Newfoundland (ET)
- The storm caused the stern lines of the *M.V. Joseph* and *Clara Smallwood* to break as passengers were preparing to board. Ferry was secured eventually, but was turned sideways in its berth (ET)
- The Bell Island ferry, *Katherine* missed its morning run due to high winds (ET)
- The police responded to 35 traffic accidents (ET)

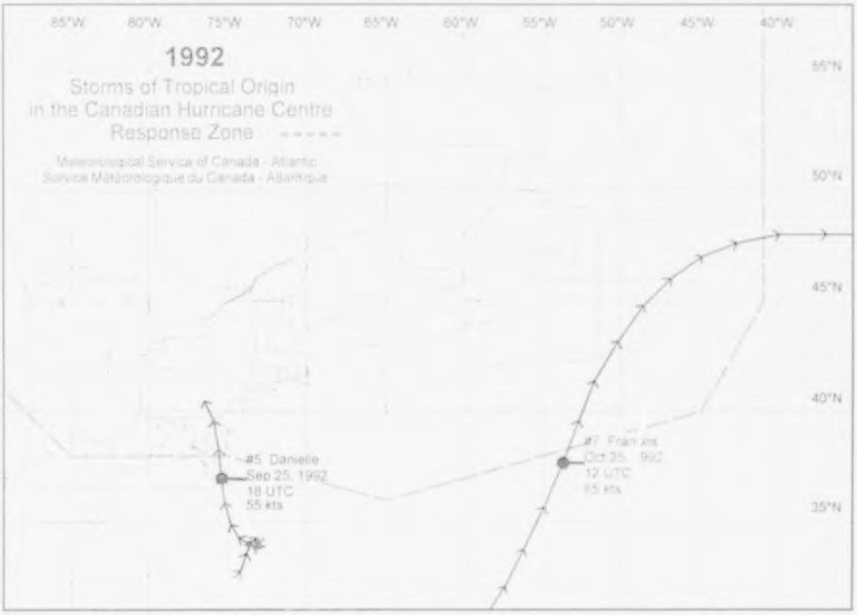
October 30, 1991

- Nine boats damaged by high waves in Torbay (ET)
- Highest wave height ever record measured 30.7 m (100 ft) (CDD)

December 17, 1993

- Six crewmembers lost from the American fishing boat, *Andrea Gail* (USCG)
- The last known position was October 28th via radio at 44°00' N, 56°40' W (USCG)
- Winds in the vicinity of this boat were 185 km/h (100 knots) (USCG)

1992 – MAP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1992
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#5 Danielle
Sep 25, 1992
18 UTC
55 kts
#7 Frances
Oct 25, 1992
12 UTC
65 kts

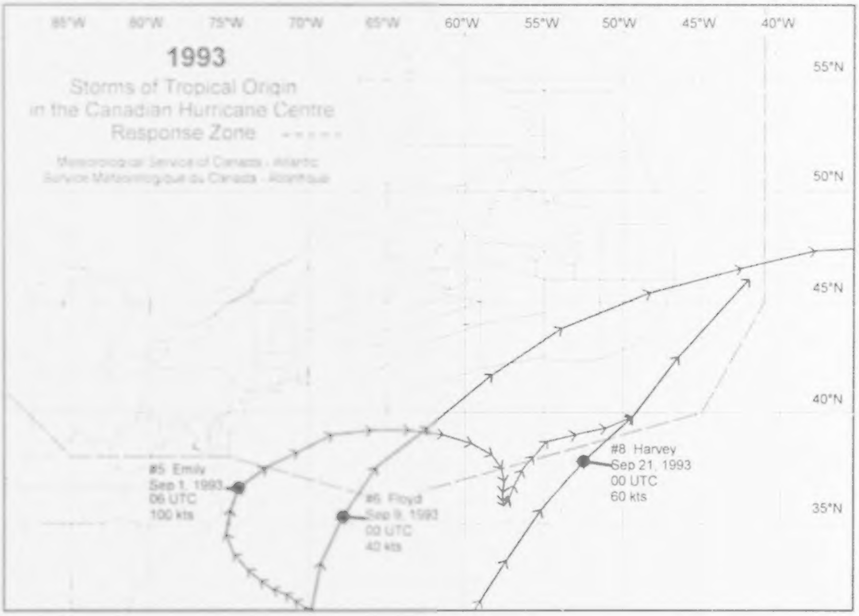
1992–Danielle

Tropical Storm Danielle originated in the Atlantic Ocean east of South Carolina on September 22, 1992, tracked north, made landfall in Virginia, and entered the CHC Response Zone on September 25th as a tropical storm. Danielle was downgraded to a tropical depression before it dissipated on September 26th. Maximum winds were reported in the CHC Response Zone and measured 102 km/h (55 knots). Canada was not impacted by this storm.

1992–Frances

Hurricane Frances originated as a tropical depression in the Atlantic Ocean east of the Bahamas on October 22, 1992. Frances tracked northeast, entered the CHC Response Zone as a hurricane on October 25th, moved into Canadian waters as a strong tropical storm with winds of 111 km/h (60 knots) near midnight that night and left the CHC Response Zone on October 27th, still as a tropical storm. Wind speeds of 139 km/h (75 knots) were recorded for this storm; however, the strongest within the CHC Response Zone were 120 km/h (65 knots). Frances remained within the southern marine section of the CHC Response Zone and did not result in any damage reported in Canada.

1993 – MAP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1993
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#5 Emily
Sep 1, 1993
06 UTC
100 kts
#6 Floyd
Sep 9, 1993
00 UTC
40 kts
#8 Harvey
Sep 21, 1993
00 UTC
60 kts

1993–Emily

Hurricane Emily originated as a tropical depression on August 22, 1993 east of the Greater Antilles. Emily's track was rather erratic throughout its history; however, it tracked generally towards the northwest until it executed a turn to the northeast just before it would have made landfall in North Carolina. Emily entered the CHC Response Zone as a category two hurricane on September 1st, and ended on September 6th; although it exited the CHC Response Zone briefly as it downgraded to a tropical storm and then a depression from September 3rd to 5th. Maximum winds recorded for this storm were 185 km/h (100 knots), 176 km/h (95 knots) in the CHC Response Zone. Gale to storm force winds affected only the extreme southeastern portion of Canadian territorial waters. The CHC issued 15 Hurricane Information Statements.

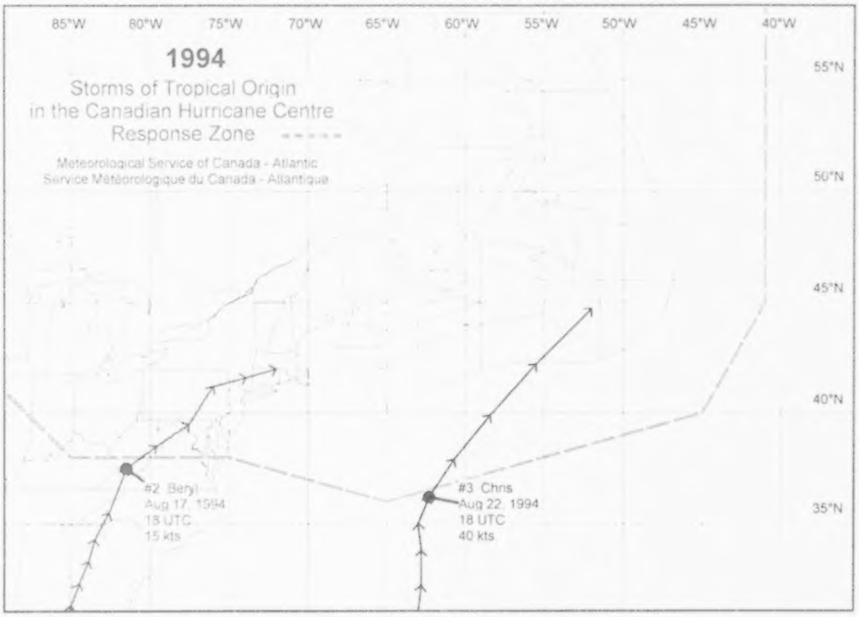
1993–Floyd

Floyd originated in the Atlantic Ocean east of the Bahamas as a tropical depression on September 7, 1993; however, it was updated to a tropical storm on the same day. Tropical Storm Floyd tracked north, then northeast and entered the CHC Response Zone on September 9th, becoming a hurricane shortly thereafter. Floyd entered Canadian waters at marginal hurricane strength (120 km/h – 65 knots) in the afternoon of September 9th then exited CHC Response Zone and exited on September 10th. The CHC issued 9 Hurricane Information Statements.

1993–Harvey

Hurricane Harvey began in the Atlantic Ocean east of the Bahamas on September 18, 1993 as a tropical depression. Harvey tracked northeast, briefly being upgraded to a hurricane, before it entered the CHC Response Zone as a tropical storm on September 21st. Harvey dissipated shortly after it entered on September 21st. Wind speeds reached a maximum of 111 km/h (60 knots) in the CHC Response Zone and 120 km/h (65 knots) for the entire storm history. Canada was not impacted by this storm.

1994 – MAP


85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
40°W
55°N
50°N
45°N
40°N
35°N
1994
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#2 Beryl
Aug 17, 1994
18 UTC
15 kts
#3 Chris
Aug 22, 1994
18 UTC
40 kts

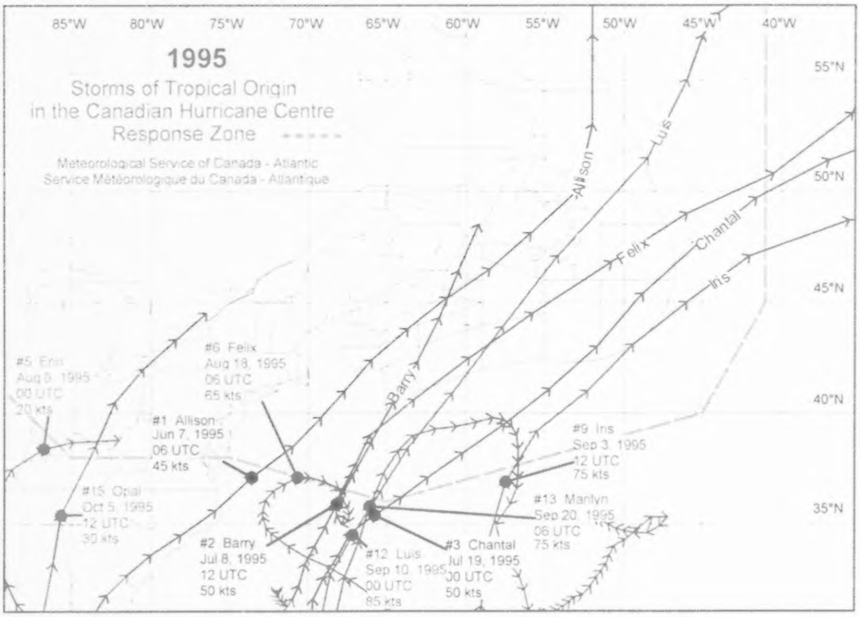
1994–Beryl

Tropical Storm Beryl originated in the Gulf of Mexico south of the Florida panhandle on August 14, 1994. Beryl tracked northeast through the eastern seaboard states, entered the CHC Response Zone on August 17th, and dissipated in Connecticut, just before the Massachusetts border, on August 19th. Beryl displayed maximum wind speeds of 93 km/h (50 knots), although the highest wind speed recorded inside the CHC Response Zone was 28 km/h (15 knots). Beryl had no direct impact on Canada.

1994–Chris

Hurricane Chris began in the middle of the Atlantic Ocean on August 16, 1994. Chris entered the CHC Response Zone as a tropical storm on August 22nd and dissipated south of Newfoundland on August 23rd. Maximum winds were recorded at 130 km/h (70 knots), while in the CHC Response Zone the winds reached a maximum of 83 km/h (45 knots). Chris entered Canadian waters at this strength on the morning of August 23rd. The storm had no direct impact on Canada. The CHC issued 11 Hurricane Information Statements.

1995 – MAP


85°W
80°W
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50°N
45°N
40°N
35°N
1995
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Allison
Luis
Felix
Chantal
Iris
Barry
#5 Erin
Aug 6, 1995
00 UTC
20 kts
#6 Felix
Aug 18, 1995
06 UTC
65 kts
#1 Allison
Jun 7, 1995
06 UTC
45 kts
#9 Iris
Sep 3, 1995
12 UTC
75 kts
#15 Opal
Oct 5, 1995
12 UTC
30 kts
#13 Marilyn
Sep 20, 1995
06 UTC
75 kts
#2 Barry
Jul 8, 1995
12 UTC
50 kts
#12 Luis
Sep 10, 1995
00 UTC
85 kts
#3 Chantal
Jul 19, 1995
00 UTC
50 kts

1995–Allison

Allison made landfall over Nova Scotia as a tropical storm with winds of 84 km/h (45 knots) on June 8th. Allison also made landfall over Newfoundland as a tropical storm with winds of 74 km/h (40 knots) on June 9th.

Hurricane Allison began on June 3, 1995 off the coast of Honduras. Allison developed into a category one hurricane bringing winds of 120 km/h (65 knots) while at its maximum strength. Allison entered the CHC Response Zone on June 7th, entering Canadian waters at midnight then brushing over eastern Nova Scotia as a 83-km/h (45-knot) tropical storm on the afternoon of June 8th. It continued for another four days before dissipating on June 11th without having impacted Canada. The CHC issued 4 Hurricane Information Statements.

Some CHC meteorological data:

- Rainfall amounts between 27 and 64 mm were reported across Nova Scotia and Prince Edward Island.

- Higher amounts of between 71 and 131mm fell over Iles de la Madeleine as well as over western Newfoundland ... all to the left of Allison's track.

- Lesser amounts of between 10 and 15 mm were observed to the right of track.

- The strongest winds recorded were at Bonavista, Newfoundland, with 67 km/h (36 knots) gusting to 89 km/h (48 knots).

1995–Barry

Barry made landfall over Nova Scotia as a tropical storm with winds of 93 km/h (50 knots) on July 9th. Barry also made landfall over Newfoundland as a tropical storm with winds of 84 km/h (45 knots) on July 10th.

Tropical Storm Barry originated off Florida's east coast on July 5, 1995. Barry only reached tropical storm status with 110 km/h (60 knots) winds. Barry entered the CHC Response Zone on July 9th, moving into Canadian waters shortly after midnight and then making landfall in eastern Nova Scotia in the evening. It carried winds up to 92 km/h (50 knots) in the CHC Response Zone and passed near Hart Island, Nova Scotia. The storm brought large amounts of rain and caused a few traffic accidents. On July 10th, Barry was a weakening extratropical cyclone and lost its identity as it crossed the southeast coast of Labrador and dissipated. The CHC issued 13 Hurricane Information Statements.

Some CHC meteorological data:

- Over land, the strongest winds were 78 km/h at Fourchu head and strongest gusts were 100 km/h at Port-aux-Basques.
- Over water, the Rowan Gorilla oil rig, located just west of Sable Island, reported a peak wind of 93 gusting to 111 km/h.
- Rainfall amounts varied considerably with the higher amounts to the left of the storm track and over western Nova Scotia. Halifax, NS, recorded 94.2 mm (3.7 in) while Farmington, NS, had the highest amount with 95.1 mm. Moncton, NB, recorded 64.2 mm.

NOVA SCOTIA

July 10, 1995

- Winds gusting up to 40 km/h (22 knots) on mainland and up to 80 km/h (43 knots) on Cape Breton (HH)

- 91 mm (3.6 in) rain on Digby County, 95.1 mm (3.8 in) rain on Farmington in Lunenburg County, 77.8 mm (3.1 in) rain on metro Halifax, 71.6 mm (2.8 in) rain on Yarmouth (HH)
- 1 m (3 ft) of water on Wyse Road in Dartmouth, other streets in Dartmouth closed (HH)
- Williams Lake Road in Halifax had sewers backed up with sewage in yards (HH)
- Maritime Old Time Fiddling Contest was cancelled (HH)
- Few traffic accidents; a car flipped over due to hydroplaning on Highway 102 (HH)

1995–Chantal

Chantal began on July 12, 1995 near the Lesser Antilles. While only reaching tropical storm status, Chantal contained winds as high as 111 km/h (60 knots). It entered the CHC Response Zone on July 19th and moved into Canadian waters with winds of 93 km/h (50 knots) near dawn on the 20th. Chantal dissipated two days later on July 22nd and did not result in any damage. Rainfall amounts were generally in the 15 to 35 mm range however, despite the fact that Chantal remained well offshore, a broad trough of low pressure and embedded thunderstorms gave higher amounts to a few locations, the highest being 67.2 mm at St. Brides, Newfoundland. The CHC issued 10 Hurricane Information Statements.

1995–Erin

Hurricane Erin developed near the Bahamas on July 31, 1995. Erin formed into a category one hurricane and contained winds of 148 km/h (80 knots). Lasting for one week, Erin entered the CHC Response Zone and dissipated on August 6th and did not affect Canada.

1995–Felix

Felix originated over the Cape Verde Islands on August 8, 1995. It intensified to a category four hurricane with maximum winds of 220 km/h (120 knots).

On August 15th, when Felix was more than 1300 km southwest of Halifax and heading towards the eastern United States, the Atlantic coast of Nova Scotia was "surprised" by dangerous surf and tidal rips during an otherwise calm and sunny day. Two days earlier when Hurricane Felix was more than 1600 km south of Halifax, it generated enormous northward-moving waves. Despite Felix's subsequent turn towards the northwest the waves pushed inexorably northward as they decayed. Because of the energy in the original waves, there was still enough energy to result in long period waves as high as 8 metres moving into the coastline, putting on quite a show . . . but also creating nearly impossible swimming conditions, resulting in beach closures by municipal lifeguards.

After threatening the eastern U.S. Felix did a "loop-de loop" offshore before eventually tracking northeast and through Canadian waters on August 21-22, at which point the winds were tropical storm force at 111 km/h (60 knots). Hurricane Felix tracked south of Newfoundland's Avalon Peninsula on August 22nd and became extratropical. Southeastern Newfoundland received 15–40 mm (0.6–1.6 in) of rain while Nova Scotia escaped the storm as it passed.

Canadian NOMAD buoys near the path of Felix generally reported near hurricane force gusts and maximum wave heights of 15 m (49 ft) to the northwest of Felix and up to 27.5 m (90 ft) to the southeast of Felix. The storm was tracked out into the Atlantic where it weakened and dissipated on August 25th. The CHC issued 13 Hurricane Information Statements.

NOVA SCOTIA

August 16, 1995

- Lawrencetown Beach was closed due to high seas two stories high that moved as fast as a freight train all while Felix was still about 1,900 km (1,180 mi) to the south (HH)
- At Osborne Head, pounding waves sent stones and gravel sailing at passing cars (HH)

August 18, 1995

- Storm moved out over sea and Nova Scotia escapes damage (ET)

1995–Iris

Hurricane Iris formed to the east of the Lesser Antilles on August 22, 1995. The system developed into a category two hurricane and contained winds reaching as high as 166 km/h (90 knots). Iris entered the CHC Response Zone on September 3rd and dissipated on

September 7th. Iris only skirted the outer Grand Banks and did not result in any damage reported in Canada.

1995–Jerry

Tropical Storm Jerry originated near the Lesser Antilles on August 22, 1995. It contained winds reaching 64 km/h (35 knots). Jerry lasted until August 28th as a tropical system, but continued into Canada as a low pressure system until September 2nd. No damage reports were located related to Jerry.

1995–Luis † (1 Canadian fatality)

Early in the morning on September 11th, Hurricane Luis tracked over the Avalon Peninsula in Newfoundland as a strong category one hurricane with winds of 147 km/h (80 knots).

Luis originated in the Cape Verde Islands on August 28, 1995. Luis strengthened to a category four hurricane sustaining maximum winds of 240 km/h (130 knots). Once inside the CHC Response Zone, Luis underwent transformation into a large extratropical storm and weakened to category one winds of 150 km/h (81 knots) prior to making in Newfoundland. One man was killed when a car hit him during the storm.

Luis was a "well-behaved" storm in that it was well-forecast in the the 3 days prior to making landfall in Newfoundland just after midnight on September 11th. Environment Canada reported that anywhere between 60–120 mm (2.3–4.8 in) of rain fell in eastern Newfoundland and high sea swells were also reported along the south coast of that province. Luis dissipated on September 12, 1995. Wind speed estimates aboard the QE-II luxury liner of the winds prior to landfall indicate a powerful hurricane moved through Canadian waters, however, comparison of ship winds to buoy winds is challenging. Following the anemometer being blown away on the QE-II, the maximum winds were estimated at 241 km/h (130 knots). The CHC issued 13 Hurricane Information Statements.

Historically speaking, one notable aspect of Hurricane Luis was what it taught about ocean waves with hurricanes. Data from the moored-buoy program had yielded some surprising results in two previous storms (the Halloween Storm of 1991 and the March 1993 Storm-of-the-Century); in both cases extreme wave heights of about 100 feet were recorded by the buoys and that data met with mixed acceptance from operational and research meteorologists alike. A Canadian NOMAD buoy once again recorded a similar wave height during the passage of Luis, however, this time there was a "ship of opportunity" in the vicinity which corroborated the data (the QE-II luxury liner). This event provided the validation that meteorologists needed to accept the buoy data and rethink the processes that generate large ocean waves with these types of storms.

- Estimated damage costs: ***$1.75 million*** (CDD)
- Province received ***$1.2 million*** in Disaster Financial Assistance from the federal government for Luis in 1995 and Gabrielle in 2001(CSC)

NOVA SCOTIA

September 11, 1995

- Swells of 3–4 m (10–13 ft) along the coast (ET, HH)

NEWFOUNDLAND

September 12, 1995

- 73 year old man was killed when he tried to cross the street in poor visibility in Placentia. He was struck by two cars (ET, HH)
- More than 100 mm (4 in) of rain fell on the Burin Peninsula (ET)
- Man sues province for *$478,000* in property damage (ET)
- Two bridges washed out near Mortier Bay, roads have washouts 80–200 m (262–656 ft) long in Marystown (ET,HH)

September 13, 1995

- Cleanup is extensive with roads only being reopened in weeks and schools cancelled due to unsafe roads and bridges in the Marystown area (ET)

1995–Marilyn

Hurricane Marilyn originated east of the Lesser Antilles in the mid-Atlantic on September 12, 1995. Deepening into a category three hurricane, Marilyn brought winds of 185 km/h (100 knots) at its maximum strength. It entered the CHC Response Zone on September 20th; however, it did not dissipate until October 1st. Marilyn remained in the marine area of the CHC Response Zone and did not impact Canada.

1995–Opal

Opal made landfall over Ontario as a tropical storm with winds of 74 km/h (40 knots) on October 6th.

Opal formed in the Gulf of Mexico and became a category four hurricane with winds of 240 km/h (130 knots). Beginning on September 27, 1995, Opal remained over land and eventually moved into Ontario on the morning of October 6th with winds of 74 km/h (40 knots). High winds and heavy rain caused power outages and flooding in Metro Toronto and the southern Ontario region. Montreal also received a significant amount of rainfall. The most affected area was southern Ontario, near and just north of Lakes Erie and Ontario. Total rainfall amounts were between 40 and 80 mm with a total of 96 mm reported from Hamilton. Some of these amounts fell in 18 hours...amounts equivalent to the average amount for the entire month of October. Strong easterly winds also affected this area. The peak wind was 102 km/h at Long Point in Lake Erie. Opal transitioned into an extratropical storm and dissipated later on October 6th. The CHC issued 2 Hurricane Information Statements.

ONTARIO

October 6, 1995

- Wind gusts of up to 102 km/h (55 knots) in southern Ontario and 25–45 mm (1.0–1.8 in) of rain (TS)
- The storm knocked down trees and power lines and caused flooding (TS)

October 7, 1995

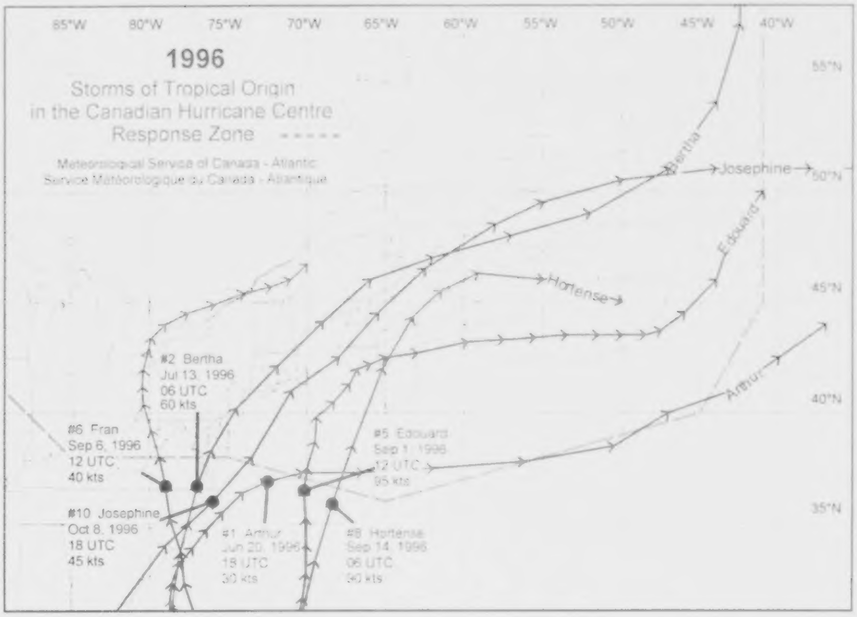
- Official total of 78.6 mm (3.1 in) of rain fell on metro Toronto (TS)

QUEBEC

October 7, 1995

- Montreal received 80 mm (3.2 in) rain which was only 2 mm (0.1 in) short of beating a 16 year old record (Hurricane Frederic) (MG)

1996 – MAP


85°W
80°W
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50°W
45°W
40°W
55°N
50°N
45°N
40°N
35°N
1996
Storms of Tropical Origin in the Canadian Hurricane Centre Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Bertha
Josephine
Edouard
Hortense
Arthur
#2 Bertha Jul 13, 1996 06 UTC 60 kts
#6 Fran Sep 6, 1996 12 UTC 40 kts
#5 Edouard Sep 1, 1996 12 UTC 95 kts
#10 Josephine Oct 8, 1996 18 UTC 45 kts
#1 Arthur Jun 20, 1996 18 UTC 30 kts
#8 Hortense Sep 14, 1996 06 UTC 90 kts

1996–Arthur

Tropical Storm Arthur developed on June 17, 1996 near the east coast of the Grand Bahamas Island. Arthur only reached tropical storm status, with winds reaching a maximum of 83 km/h (45 knots). The storm entered the CHC Response Zone on June 20th as a tropical depression and exited the CHC Response Zone on June 21st. Most of Arthur's wind was experienced in the offshore areas. Continuing on for two more days, Arthur was absorbed by a larger extratropical low midway between Newfoundland and the Azores on June 23rd.

1996–Bertha

Bertha made landfall over New Brunswick as a tropical storm with winds of 102 km/h (55 knots) on July 14th. Bertha also made landfall over Prince Edward Island

and Newfoundland as a tropical storm with winds of 93 km/h (50 knots) on July 14th.

Hurricane Bertha originated on July 5, 1996 from a tropical wave off Africa. Bertha became a category three hurricane characterized by winds at 185 km/h (100 knots). The hurricane continued along the northeast coast of North America and became an extratropical hurricane. Upon entering the CHC Response Zone on July 13th Bertha was a tropical storm with winds of 111 km/h (60 knots). The storm was at 102 km/h (55 knots) when it entered New Brunswick near dawn on the 14th. The Maritimes received heavy rain and high winds causing some flooding and numerous power outages. On July 17th Hurricane Bertha exited the CHC Response Zone and dissipated. The CHC issued 13 Hurricane Information Statements.

Some CHC meteorological data:

- The maximum wind speed recorded was 87 km/h (47 knots) at Sagona Island, Newfoundland.
- Highest rainfalls fell near, or to the left of track. Miramichi Airport (CFB Chatham, New Brunswick) reported an all-time 24 hour record rainfall of 93 mm. An unofficial report of 94 mm was received from a weather watcher in Fredericton, New Brunswick. Elsewhere, significant rainfall amounts were within the 40 to 75 mm range.

NOVA SCOTIA

July 15, 1996

- Winds of 70–80 km/h (30–40 knots) hit the mainland (HH)
- The storm averaged 30–40 mm (1.2–1.5 in) of rain (HH)
- There were major power outages in Antigonish, Bedford, Halifax, Wolfville, Truro, and Amherst. Other outages were also reported due to falling branches and telephone poles catching on fire (HH)
- Power outages began at Yarmouth early in the morning and followed throughout the province (HH)
- Electrical wires were down on the following Halifax streets: Oxford Street, Swaine Street, Chebucto Road, and Wallace Heights in Dartmouth (HH)

NEW BRUNSWICK

July 15, 1996

- 55 mm (2.1 in) of rain fell at St. Stephen (G)
- The southern part of the province received 70–90 mm (2.7–3.5 in) of rain, resulting in minor flooding (HH)

- Bertha was downgraded to a post tropical storm just as it entered New Brunswick (HH)

PRINCE EDWARD ISLAND

July 15, 1996

- Winds were measured at 67 km/h (36 knots) (G)
- 38 mm (1.5 in) of rain fell on the province (G)
- Fallen trees and intermittent power outages were felt throughout the province (G)
- Power outages were reported to approximately 100 Wood Islands homes (G)

July 16, 1996

- Cancellation of the raising of the *Irving Whale* Oil Barge in the Gulf of St. Lawrence. The crew involved in the raising stayed ashore for two more days while ships used in the operation stayed in shelter at Egmont Bay (G)

NEWFOUNDLAND

July 17, 1996

- Corner Brook triathlon race officials cancelled the bike portion of the race due to wet conditions and high winds (ET)

1996–Edouard

Hurricane Edouard formed southeast of the Cape Verde Islands on August 19, 1996. In the following days, Edouard developed into a category four hurricane, bringing winds that reached 231 km/h (125 knots). Hurricane Edouard continued into the CHC Response Zone on September 1st and was then classified as a category two hurricane with winds of 157 km/h (85 knots). Edouard then weakened to a marginal category one hurricane before reaching Canadian waters on the evening of September 2nd. The storm passed south of Nova Scotia and Newfoundland, exiting the CHC Response Zone on September 6th, but not before bringing heavy rain and high winds to Nova Scotia. The CHC issued 15 Hurricane Information Statements.

Some CHC meteorological data:

- Maximum wind speeds with Edouard were gusts to near 70 km/h, mainly long the Atlantic coast of mainland Nova Scotia. A gust to 120 km/h was recorded over the

Cape Breton Highlands. Over Atlantic waters, maximum speeds were in the 74 to 93 km/h range.

- Maximum seas near the storm centre were near 11 m.
- Higher than normal water levels were reported along the south coast of Nova Scotia where seas of 3 to 5 m were observed.
- The highest rainfall amount was 136 mm at Yarmouth, Nova Scotia. The heaviest rain fell when Edouard was at its closest point to land and at a time when the speed of the storm, was the slowest. No significant rainfall was reported over Newfoundland.

September 4, 1996

- A section of the *Titanic* was in the process of being raised from the ocean bottom. It was within 65 m (213 ft) from the surface when heavy seas caused ropes to slip, resulting in the section sinking back to the bottom of the Atlantic (ET)

NOVA SCOTIA

September 3, 1996

- Rainfall between 95–140 mm (3.8–5.6 in). Winds in Cape Breton were recorded at 120 km/h (65 knots) (CHC)
- Marine Atlantic cancelled ferry services between Digby and Saint John, New Brunswick (ET)
- Beaches were closed along the eastern shore of the province (ET)

1996–Fran

Fran made landfall over Ontario as a tropical depression with winds of 55 km/h (30 knots) on September 7th. Fran also made landfall over Quebec as a tropical depression with winds 46 km/h (25 knots) on September 9th.

Hurricane Fran began on August 23, 1996 near the Cape Verde Islands from a tropical wave from Africa. Fran moved into the CHC Response Zone on September 6th and continued over the Great Lakes and into southern Ontario on the evening of the 7th. At this point, Fran had weakened to a tropical depression, carrying winds of 55 km/h (30 knots). Heavy rain was felt in the Ontario region. Hurricane Fran finally dissipated on September 10th.

Some CHC meteorological data:

- Wind was not a significant factor over Canada with Fran.
- There were, however, heavy rainfalls over southern Ontario. Rainfall amounts were between 45 and 65 mm in a 24 hour period between September 6 and 8. No significant amounts were reported in Quebec or Atlantic Canada where the remnants of Fran had become a weak low pressure system.

ONTARIO

September 8, 1996

- Lambton and Kent Counties received 100 mm (4 in) of rain while the Greater Toronto area received 30 mm (1.2 in) (TS)
- Downed wires caused several power outages in the Toronto area (TS)
- Several surfers and one boater got into trouble at Lake Ontario forcing the Metro Police Marine Unit to respond to the incident (TS)
- Firefighters searched Lake Ontario after reports of an overturned kayak. No sightings were reported (TS)
- Floodwaters rushed 10 km (6.2 mi) into Don Valley Parkway forcing police to seal of south entrances to the area (TS)
- Rain cancelled the third round of PGA Tour Golf Tournament at Oakville's Glen Abbey Course (TS)
- Local firefighters ran around helping to protect live power wires which fallen due to winds and branches (TS)
- Parkdale homes where without power from 3:00–6:00 pm due to fallen wires (TS)
- Heavy rain and wind was reported in Hamilton and southern Ontario between Chatham and Sarnia (TS)

1996–Hortense

Hortense crossed over eastern Nova Scotia, near Sheet Harbour, on September 15, 1996. This category one hurricane attained winds of 130 km/h (70 knots). This was the first hurricane to make landfall in Nova Scotia since 1975.

Hurricane Hortense originated on September 3, 1996 midway between the Cape Verde Islands and the Lesser Antilles and eventually made landfall in Nova Scotia. Hortense was a category four strength hurricane at its maximum strength carrying winds of 222 km/h (120 knots). Hortense entered the CHC Response Zone near dawn on September 14th as a category two hurricane with winds reaching 158 km/h (85 knots) and it maintained this strength as it moved into Canadian waters near noon. The storm slowed down and weakened as it tracked north northeast, making landfall near Sheet Harbour, Nova Scotia, near midnight, with winds of 130 km/h (70 knots). There were many power outages, trees blown down, roofs torn away, and roads damaged. It was estimated that *$3 million* of damage was reported in Nova Scotia alone. Hortense finally dissipated on September 16th. The CHC issued 19 Hurricane Information Statements.

Some CHC meteorological data:

- Maximum sustained wind speeds were near 120 km/h. A gust of 161 km/h was recorded at St. Paul Island located in the Cabot Strait between Nova Scotia and Newfoundland.
- Significant wave heights were in excess 8.0 m with maximum waves near 18.0 m.
- Storm surge values in excess of 100 cm were reported at Halifax and along Nova Scotia's eastern shore.
- Highest rainfall amounts were in excess of 135 mm and large amounts fell in short time periods (18 to 22 mm per hour in some areas.) In some cases, the amounts over one or 2 hours exceeded normal monthly totals.

Of note:

- The Hurricane was traveling at 50 km/h (27 knots) over the Maritimes (G)
- Hurricane Hortense total property losses approached *$5 million* (Weather Impact on Canada Website: **http://sciencepolicy.colorado.edu/socasp/weather1/street.html)**

NOVA SCOTIA

Canadian Coastal Conference

- Halifax tide gauge recorded a 1 m (3.2 ft) storm surge and was coincident with a high tide, which caused water to levels to rise to 2.7 m (9 ft) (CCC)
- Inshore wave heights of 8.7 m (30 ft) were recorded at Halifax (CCC)
- At North Sydney storm surge was measured at 0.8 m (2.5 ft) (CCC)

September 15, 1996

- Wind gust measured over 100 km/h (54 knots) (ET)
- Winds up to 140 km/h (76 knots) had been measured when Hortense approached the eastern shore (ET)
- 50 mm (2 in) of rain fell in a rain band ahead of the hurricane (ET)
- Power was lost in Halifax just minutes before the final at the World Cup of Hockey was set to begin between Canada and United States (ET)
- Many residences took to the malls shopping for emergency supplies and the Red Cross issued a warning to stock up on food and other necessities (ET)
- Telephone and power crews and the Coast Guard were on standby in the region (ET)
- Hurricane Hortense passed by during high tide resulting in higher than normal water levels (ET)

September 16, 1996

- In Eastern Passage, there was 100 mm (4 in) of rainfall and water was spilling from the main water sewer system (TJ)
- Beaver Island reported 137 mm (5.5 in) of rain, with 109 km/h (59 knots) winds. Sydney reported 102 mm (4.1 in) of rain and 82 km/h (44 knots) winds. Grand Etang reported 139 km/h (75 knots) winds, St. Paul's reported 161 km/h (87 knots) winds (TJ)
- Pictou received 103 mm (4.1 in) of rain over the two day period (G)
- Bedford received over 137 mm (5.5 in) of rain (G)
- Seas were reported to be 8 m (26 ft) high off the eastern shore and Cape Breton (HH)
- In Halifax, office windows were broken and roofs blew off (G)
- A 1 m (3 ft) long lobster weighting five kilograms was washed ashore at Lawrencetown Beach (HH)
- Beach rocks 0.3 m (1 ft) in diameter were found in a home on Lawrencetown Beach (HH)
- Three of five families were forced to leave there home on Lawrencetown Beach and were stranded at a bed and breakfast (HH)
- A man opening a music store in the basement of a home at Lawrencetown Beach was flooded. He had most of the work done to the store before the storm and only recovered a few musical instruments (HH)
- In East Lawrencetown, an ocean wave as big as an 18-wheeler crashed into a house destroying half of the home (G)
- One home had a basement window smashed out by a wave on Lawrencetown Beach on the eastern shore. Water reached as high as the bed and ruined a lot of the clothing and a pool table in the room. The sea and the wind also tossed around their storage barn (TJ)
- In Green Bay, Lunenburg County waves as high as 6 m (20 ft) pounded the beach and a minivan was hurled about 9 m (30 ft) into a flooded yard. One tree fell onto the roof of a cottage resulting in severe damage (HH)
- In Wreck Cove, Cape Breton there was a bridge washed out resulting in power crews being delayed in restoring power (HH)
- 2,000 houses without power in the Stewiacke/Shubenacadie area for hours (HH)
- North end of Halifax was with out power for up to 10 hours (HH)
- The storm left large boulders on the highway and washed a freezer onto a front lawn in the Lawrencetown Beach area (HH)
- Many sections of the Cabot Trail were flooded and reduced to one lane (HH)
- The Chedabucto Bay area was not badly damaged. The power flicked several times and only a few branches had fallen down (HH)
- Three accidents occurred on the Bicentennial Highway due to hydroplaning (HH)

- One man was sent to hospital with serious injuries when his car hit a light pole at Windsor Street and Connaught Avenue (HH)
- Halifax experienced driving rain and fierce winds which caused shattered windows and toppled trees across the province (ET)
- Flooding was reported at Mount Saint Vincent University on the Bedford Highway and in Eastern Passage (HH)
- Riverside Music Festival was force to move indoors to Middleton and District Arena (HH)
- In Cape Breton, a woman drove into Clyburn Brook, which was flooded. The volunteer firefighters from Ingonish helped save the women; however, two firefighters were injured during the rescue (TJ)
- Moosehead, Mushaboom and Musquodoboit were all hit hard by the hurricane (G)
- Ten of thousands of people were without power in Nova Scotia on Sunday night (G)
- One man from Purcells Cove was injured during the storm when he was trying to fasten his boat (HH)

NEW BRUNSWICK

September 16, 1996

- Saint John reported 54.5 mm (2.2 in) of rain however most of it was due to a system, which preceded Hortense. The maximum winds reported were 44 km/h (24 knots) (TJ)

PRINCE EDWARD ISLAND

September 16, 1996

- Wind of 130 km/h (71 knots) passed through the island causing havoc with power lines (G)
- 44 mm (1.8 in) of rain was measured in Charlottetown while wind gust as high as 83 km/h (45 knots) were measured (G)
- The Prince Edward Island ferry service was cancelled for most of Saturday and two crossings on Sunday (G)
- Power in Charlottetown and the western part of the island was also lost (G)
- Kings County suffered the brunt of the storm (G)
- Residence in Montague and Murray River were without power for most of the day (G)
- An insulator broke on a transmission line at Souris power station resulting in East Point and Souris to lose power for about two hours (G)

NEWFOUNDLAND

September 16, 1996

- 40 mm (1.6 in) of rain fell in St. John's, Mount Pearl and surrounding area (ET)
- Heavy rains and high winds were reported on the Burin Peninsula. Winds of 60 km/h (32 knots) forced the Challenge Cup Soccer Finals to be cancelled (ET)
- *$4,000* of damage was expected to a man's house on Fahey Street, Kilbride. He experienced flooding to his basement (ET)
- Many others on the same street (Fahey Street) also experienced damages (ET)
- Two firefighters were sent to hospital when their rescue vehicle hydroplaned on the Trans Canada Highway near Foxtrap and hit a pumper truck while responding to another vehicle accident. One firefighter was admitted to the hospital with a broken leg, head wound, and rib injuries. The other also had head wounds but was released. *$50,000* damage was done to the trucks (ET)
- All sporting activities were cancelled within the region (ET)
- Approximately 500 people have called with flood related problems due to the storm sewers not being able to handle the rain (ET)
- Several main routes were closed due to flooding including the Waterford Bridge Rd. It was closed from Cowan Avenue to Corpus Christi Church (ET)
- Mount Carson Avenue in Mount Pearl was closed when the road was washed away (ET)
- Kenmount Road received some flooding near the Newfoundland Labrador Teachers Association Building, while flooding was also present at Brookfield Road and Perlin Street, next to Symes Bridge on Waterford Bridge Road and Hillview Drive, and at McDonald Drive and Torbay Road (ET)
- Four hydroplaning accidents were reported (ET)

1996–Josephine

Josephine made landfall over Nova Scotia, Prince Edward Island and Newfoundland as a tropical storm with winds of 84 km/h (45 knots) on October 9-10th.

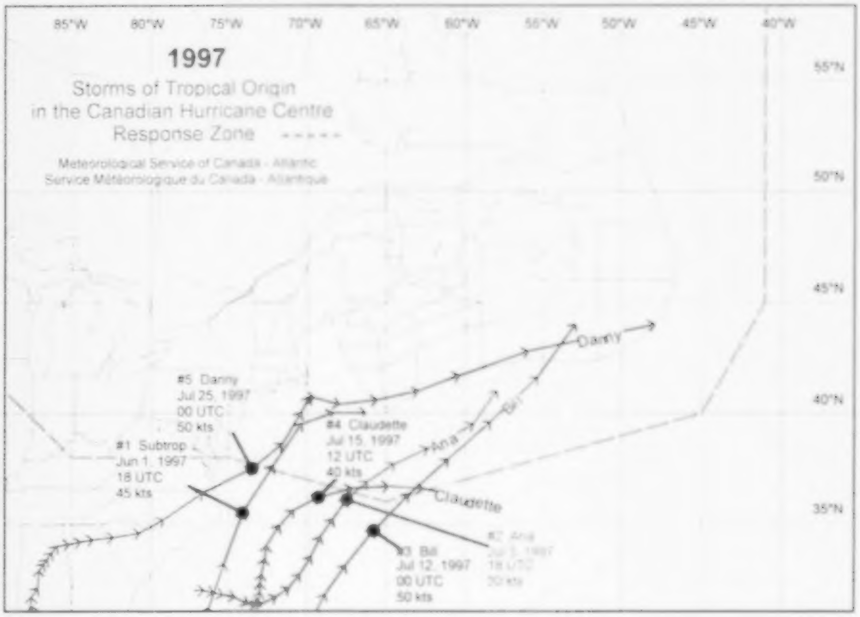
Tropical storm Josephine formed on October 4, 1996 in the Gulf of Mexico. Josephine only reached tropical storm status, bringing winds of 111 km/h (60 knots). While entering the CHC Response Zone and Canadian waters on October 9th, Josephine brought winds of 83 km/h (45 knots) to the region. Those winds were maintained as it made landfall over western Nova Scotia early that afternoon. High winds and heavy rains disrupted some ferry services, and damaged power lines in Nova Scotia. Josephine left the CHC Response Zone on October 11th and dissipated on October 16th.

NOVA SCOTIA

October 10, 1996

- Strong winds and heavy rain occurred throughout the province (HH)
- The Prince Edward Island to Nova Scotia ferry was shut down; however the Prince Edward Island to New Brunswick ferry was still running with significant delays. In addition, the ferry between Bar Harbour, Maine and Yarmouth was cancelled in the morning (HH)
- Power lines were down in Amherst and Fort Lawrence area, which caused school cancellations (HH)

1997 – MAP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1997
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone - - - - -
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
#5 Danny
Jul 25, 1997
00 UTC
50 kts
#1 Subtrop
Jun 1, 1997
18 UTC
45 kts
#4 Claudette
Jul 15, 1997
12 UTC
40 kts
#3 Bill
Jul 12, 1997
00 UTC
50 kts
#2 Ana
Jul 3, 1997
18 UTC
30 kts
Danny
Bill
Ana
Claudette

1997–Subtrop 1

Subtrop #1 began on May 31, 1997 just off the Florida coastline. The storm only reached tropical storm status and entered the CHC Response Zone at its maximum strength on June 2nd. Inside the CHC Response Zone, it brought winds of 83 km/h (45 knots) before dissipating later that same day.

1997–Ana

Tropical Storm Ana began on June 30, 1997 east of the Carolina coastline. Ana contained winds of 74 km/h (40 knots) at its maximum strength, and it brought winds of 55 km/h (30 knots) to the CHC Response Zone after entering on July 3rd. Tropical Storm survived within the CHC Response Zone for two more days before dissipating on July 5th without resulting in any damage being reported. The CHC issued 8 Hurricane Information Statements.

1997–Bill

Hurricane Bill began on July 11, 1997 south west of Bermuda. Bill intensified into a category one hurricane and developed hurricane force winds of 120 km/h (65 knots) while inside the CHC Response Zone on July 12th. Bill dropped just below hurricane strength as it moved into Canadian waters on the evening of the 12th, dissipating shortly thereafter. Bill did not impact Canada. The CHC issued 8 Hurricane Information Statements.

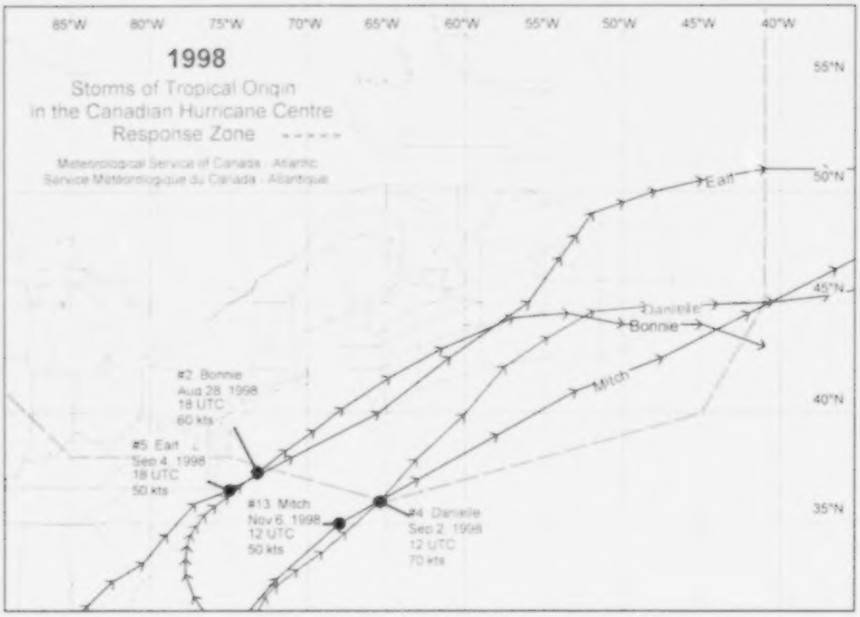
1997–Claudette

Tropical Storm Claudette began on July 13, 1997. Forming off the eastern coastline of the Carolinas, Claudette only developed into a tropical storm and never reached hurricane status. Claudette entered the CHC Response Zone on July 15th as it weakened slightly. It brought winds as high as 74 km/h at its maximum strength and winds of 64 km/h (35 knots) within the CHC Response Zone. Tropical Storm Claudette both left the CHC Response Zone and dissipated on July 16, 1997 without damaging Canada. The CHC issued 2 Hurricane Information Statements.

1997–Danny

On July 16, 1997, Hurricane Danny developed within the Gulf of Mexico. Danny intensified into a category one hurricane containing winds of 129 km/h (70 knots). It entered the CHC Response Zone on July 25th, however, it had already been downgraded to a tropical storm by that point. Danny brought winds of 92 km/h (50 knots) to the CHC Response Zone and 83 km/h (45 knots) to Canadian waters as it moved through the extreme offshore areas. Maximum seas reported were in the 5 to 7 m range. Rainfall amounts near 20 mm were reported over extreme southwestern Nova Scotia. Elsewhere, little or no effects were felt over land. The storm dissipated on July 27th. The CHC issued 5 Hurricane Information Statements.

1998 – MAP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35°N
1998
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Earl
Danielle
Bonnie
Mitch
#2 Bonnie
Aug 28 1998
18 UTC
60 kts
#5 Earl
Sep 4 1998
18 UTC
50 kts
#13 Mitch
Nov 6 1998
12 UTC
50 kts
#4 Danielle
Sep 2 1998
12 UTC
70 kts

1998–Bonnie

Bonnie originated east of the Lesser Antilles on August 19, 1998 and developed into a category three hurricane. Its winds reached a maximum of 185 km/h (100 knots). Bonnie entered the CHC Response Zone on August 29th, moving in Canadian waters near noon, however, it had weakened to a tropical storm with winds of 83 km/h (45 knots). Much of Bonnie's rain fell to the east of the track, which was out over the ocean. However high winds and heavy seas were reported it several areas. The East Scotian Slope buoy reported speeds of 93 with gusts to 115 km/h. The maximum speed over land was a gust to 102 km/h over the Cape Breton Highlands. Significant wave heights, reported to the right of track, were in the 7 to 11 m range. The maximum wave heights were between 14 and 18 m. Rainfall amounts over land were in the 15 to 25 mm range for Nova Scotia. Radar reports, however, indicated heavier rainfall just off the Atlantic coast of Nova Scotia. Further offshore, at Sable Island, 33 mm were reported. Effects on land for Newfoundland were minimal as most of the precipitation and strong winds remained offshore. Bonnie moved outside the CHC Response Zone on August 31st and dissipated on the same day. The CHC issued 26 Hurricane Information Statements.

NEWFOUNDLAND

- Offshore, a maximum wind speed of 75 km/h (40 knots) with gusts of 100 km/h (54 knots) was recorded at the Southwestern Grand Banks buoy. The maximum significant wave height from the same buoy was 14.4 m (47 ft) (CHC)

NOVA SCOTIA

August 30, 1998

- Wind Gusts of 50–55 km/h (27–30 knots) in Yarmouth (HH)
- Winds of 75 km/h (40 knots) in Sheet Harbour (HH)
- Maximum wind speeds were 55–75 km/h (30–40 knots) with gusts to 75–93 km/h (40–50 knots) (CHC)
- Offshore, a maximum wind speed of 93 km/h (50 knots) with a gust of 115 km/h (62 knots) was recorded at the West Scotian Slope buoy (CHC)
- On Cape Breton Highlands, a gust of 102 km/h (55 knots) was reported (CHC)
- 8.1 mm (0.3 in) of rain was received in Yarmouth (HH)
- At Sable Island, 33 mm (1.3 in) of rain were reported (CHC)
- Along the coast, rainfall amounts were 15–25 mm (0.6–1.0 in) (CHC)
- Sable Island experienced 6–7 m (20–23 ft) waves and 100 km/h winds (HH)
- The highest significant wave height was 10.8 m (35 ft) at the East Scotian Slope buoy. A maximum wave height of 17.9 m (58 ft) was recorded at the Laurentian Fan buoy (CHC)

1998–Danielle

Hurricane Danielle began on August 24, 1998 off the Cape Verde Islands. It developed into a category two hurricane and contained winds reaching 166 km/h (90 knots). Danielle entered the CHC Response Zone on September 2nd and moved into Canadian waters before dawn on the 3rd, bringing 130 km/h (70 knots) to offshore waters. The storm ultimately dissipated in the extreme eastern Atlantic near the U.K. on September 8th.

Danielle tracked through Environment Canada's moored buoy network and recorded some remarkable wave data. In particular, the Laurentian Fan buoy recorded a significant wave height of 15.8 m and a maximum wave of over 25 metres. While these aren't the largest waves recorded in Canadian waters, they do represent the fastest wave growth ever recorded during the first decade of the buoy program. Significant wave heights grew by more than 9 metres (from 6.5 m to 15.8 m) in just two hours at the buoy as a "wall of waves" arrived at the location. A case of extreme wave-storm resonance was the phenomenon responsible as the storm and waves matched speeds, allowing for tremendous growth.

Danielle did not cause any damage reported in Canada. The CHC issued 13 Hurricane Information Statements.

1998–Earl

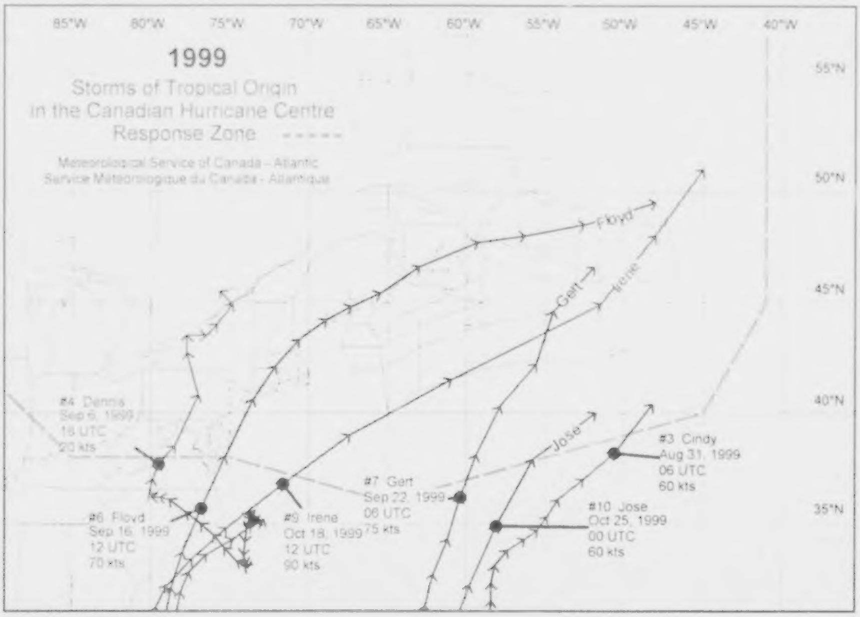
Earl made landfall over Newfoundland as a transitioned tropical storm with winds of 93 km/h (50 knots) on September 5th.

Hurricane Earl began on August 31, 1998 in the Gulf of Mexico. It strengthened into a category two hurricane with winds reaching 157 km/h (85 knots). Earl weakened to a tropical storm as it crossed Florida and began transformation into an extratropical system before exiting Georgia. By the time the remnant system moved off the coast near New Jersey it had weakened considerably. A day later, on September 5th, as it passed well south of Nova Scotia, the remains of Earl underwent rapid re-intensification into an intense extratropical cyclone which brought 50-65 mm of rain to eastern Nova Scotia and Newfoundland and 90-100 km/h (more than 50 knot) sustained winds to offshore waters. The strongest reported wind was a gust to 106 km/h at Bonavista, Newfoundland. The highest reported seas were 11.6 metres at the Southwestern Grand Banks buoy. No documented reports of impact on Canada were found.

1998–Mitch

Hurricane Mitch began on October 22, 1998 near Colombia's northern coast. Mitch intensified into a deep category five storm and contained winds as high as 287 km/h (155 knots). It entered the CHC Response Zone on November 6th and dissipated on November 9th. Mitch was not responsible for any damage in Canada.

1999 – MAP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1999
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone -----
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Floyd
Gert
Irene
Jose
#4 Dennis
Sep 6, 1999
18 UTC
20 kts
#6 Floyd
Sep 16, 1999
12 UTC
70 kts
#9 Irene
Oct 18, 1999
12 UTC
90 kts
#7 Gert
Sep 22, 1999
06 UTC
75 kts
#3 Cindy
Aug 31, 1999
06 UTC
60 kts
#10 Jose
Oct 25, 1999
00 UTC
60 kts

1999–Arlene

Arlene formed southeast of Bermuda on June 11, 1999 and reached maximum storm strength of a tropical storm. The maximum winds recorded were 92 km/h (50 knots) and it entered the CHC Response Zone on June 18th. Arlene became a low pressure system that tracked north over the ocean and passed over the Avalon Peninsula. The storm dissipated in the CHC Response Zone on June 20th and had no reported impact on Canada. The CHC issued 3 Hurricane Information Statements.

1999–Cindy

Hurricane Cindy originated off the west coast of Africa near the Cape Verde Islands, on August 19, 1999. Cindy attained winds of 120 km/h (65 knots) and entered the CHC Response Zone on August 31st with winds of 110 km/h (60 knots). In the CHC Response Zone, Cindy was downgraded to a tropical storm and left on September 3rd. Winds 115 km/h (62 knots) and wave heights of 16.7 m (55 ft) were reported off the Grand Banks. No significant effects were felt on land as the storm stayed well to the southeast region of the CHC Response Zone. The CHC issued 13 Hurricane Information Statements.

1999–Dennis

Dennis made landfall over Ontario and Quebec as a tropical depression with winds of 37 km/h (20 knots) on September 8th.

Dennis began on August 24, 1999 near the Bahamas and reached category two hurricane strength. The maximum winds achieved were 167 km/h (90 knots) and they occurred well south of Canada. Upon entering the CHC Response Zone on September 7th, winds were only 37 km/h (20 knots) classifying the storm as a tropical depression. This storm tracked inland through North Carolina and then continued north into Canada. Dennis dissipated on September 9th in the CHC Response Zone over southern Quebec and had no apparent effects on Canada.

1999–Floyd

Floyd made landfall over New Brunswick as a tropical storm with winds of 74 km/h (40 knots) on September 18th. Floyd also made landfall over Prince Edward Island and Newfoundland as a tropical storm with winds of 65 km/h (35 knots) on September 18th.

Hurricane Floyd initiated east of the Barbados on September 7, 1999. Floyd became a category four hurricane with maximum winds of 231 km/h (125 knots). Hurricane Floyd entered the CHC Response Zone on the evening of September 16th where it was downgraded to a tropical storm shortly after. Floyd moved along the eastern seaboard of the United States and tracked through parts of Atlantic Canada. Maximum winds were 83 km/h (45 knots) with seas of 8–9 m (26–30 ft) when it crossed the CHC Response Zone. The rain and wind caused inconveniences and damage in Quebec, New Brunswick, Prince Edward Island, and Nova Scotia. The tropical storm left the CHC Response Zone on September 20. At the time of the storm, Floyd generated the greatest media interest of any hurricane in the history of the Canadian Hurricane Centre, including that which accompanied Hurricane Hortense in 1996. In light of the pre-storm hype in Atlantic Canada, Floyd turned out to be a "disappointment" to the media. The CHC issued 14 Hurricane Information Statements.

September 18, 1999

- No major damage caused by Floyd (ET)
- Minor traffic accidents and fallen trees across Maritimes (TJ)
- 62 mm of rain fell in Fredericton, NB (CHC)

NOVA SCOTIA

September 17, 1999

- 66 schools in Southwest Regional School District closed for the day (HH)
- Cancelled crossing of the ferry *The Cat* from Yarmouth to Bar Harbour, Maine (HH)

September 18, 1999

- 98 km/h (53 knots) winds at Grand Etang, Inverness County (HH)
- 63 km/h (34 knots) winds in Halifax (HH)
- Greenwood had 62 km/h (33 knots) winds and 32 mm (1.3 in) of rain (HH)
- Yarmouth had 59 km/h (32 knots) winds and 14 mm (0.6 in) of rain (HH)
- Sydney had 10 mm (0.4 in) of rain (HH)
- Shearwater had 30 mm (1.2 in) of rain (HH)
- Power outages in Amherst, Goshen, Windsor, Wolfville, and Dartmouth. Approximately 6,000 without power in Nova Scotia (HH)
- At a Dartmouth Superstore some employees and shoppers were evacuated after water on the roof affected the ventilation system (HH)

NEW BRUNSWICK

September 18, 1999

- Rainfall amounts: Fredericton 75 mm (3 in), Bathurst 73.5 mm (2.9 in), Miramichi 54 mm (2.2 in), Moncton 31 mm (1.4 in), Saint John 29 mm (1.4 in), Charlo and Campbellton 17 mm (0.7 in) (TJ)
- There were some backed up drains in Fredericton (ET)
- 100 employees of the Sable Offshore Energy Project flown back to shore as a precaution (G)

PRINCE EDWARD ISLAND

September 18, 1999

- Reports of wind gusting to 104 km/h (56 knots) on the Northumberland Strait, forcing the closure of the Confederation Bridge to transport trucks and campers (ET)

QUEBEC

September 18, 1999

- 60 km/h (32 knots) winds in Montreal region (MG)
- St. Lawrence River area had 118 km/h (64 knots) winds (HH)
- Montreal region had 70 mm (2.8 in) of rain (MG)
- University of Montreal cancelled classes due to power outages (MG)
- Power outages in Quebec City (MG)
- Bad weather may have contributed to a five car accident on Highway 15 in Quebec City (MG)

1999–Gert

Gert formed off the west coast of Africa, in the Cape Verde Islands, on September 11, 1999. Hurricane Gert entered the CHC Response Zone on the afternoon of September 22nd, moving into Canadian waters that evening. Gert was downgraded to a tropical storm on September 23rd after it passed just east of the Avalon Peninsula of Newfoundland. Maximum winds were 130 km/h (70 knots) but they dropped below hurricane strength just as Gert entered Canadian waters. The combination of winds and storm track resulted in maximum waves of 23.6 m (75 ft) in Canadian waters. These large waves resulted in large and dangerous surf in Placentia Bay, especially near the town of St. Bride's.

Gert did not exhibit the often observed post-tropical rain pattern, as the rain area was to the right of the storm, not the left. ***Thousands of dollars*** in damage were reported in Newfoundland, St. John's in particular, and in Nova Scotia. The storm left the CHC Response Zone on September 24th. The CHC issued 15 Hurricane Information Statements.

Some CHC meteorological data:

- The maximum wind speed reported was a gust to 122 km/h at the Laurentian Fan buoy (44141).

NEWFOUNDLAND

September 24, 1999

- 120 km/h (65 knots) winds over the Grand Banks (HH)
- Seas were on average 9 m (30 ft) high (HH)
- Three men knocked off a wharf by huge wave in St. Bride's (HH)
- No deaths but one man was sent to intensive care when a wave knocked him from the wharf into the St. Brides's harbour (ET)
- *$2 million* needed to fix wharf in St. Bride's (ET)
- Five boats destroyed, 45 boats suffered varying degrees of damage in St. Bride's harbour (HH)
- Destroyed the breakwater in St. Brides harbour 1 m thick by 6 m long (3 ft by 20 ft) slabs of cement (ET)
- Flights cancelled to and from St. John's (HH)
- In St. John's, there were power outages and uprooted trees (ET)
- Damage was in the ***hundreds of thousands of dollars*** range in St. John's (ET)
- At a fish plant in Lord's Cove waves smashed in doors, ripped of siding and clapboard. The waves also washed a small shed and large fish boxes off the wharf (ET)
- Two fishing stages were washed off their foundations in Rock Harbour (ET)

September 25, 1999

- Fisherman lost gear in St. Bride's harbour (ET)
- The St. Bride's harbour was shut down due to excessive damage (ET)

1999–Harvey

Harvey formed in the Gulf of Mexico on September 19, 1999 and grew to a tropical storm with maximum winds of 93 km/h (50 knots). Harvey became an extratropical depression in the subtropics and entered the CHC Response Zone only as a remnant circulation centre; hence, this part of the storm's evolution is not contained in the NHC dataset.

As the remnant centre from Harvey moved to near the Maritimes it underwent rapid intensification as it transformed into an intense extratropical cyclone. The remnant system tracked in a northeasterly direction making landfall over eastern Nova Scotia and continuing through to Newfoundland. Maximum winds of 106 km/h (57 knots) gusting to 128 km/h 69 knots) were reported at Port-aux-Basques. Some areas of southeastern New Brunswick and Northern Nova Scotia received over 250 mm (10 in) of rain in a 30 hour period. Rainfall in Oxford, NS, was 302 mm (12.1 in) and 50–100 mm (2–4 in) in

Labrador. As well, winds in excess of 100 km/h were reported over eastern Nova Scotia and western Newfoundland at the height of the storm's intensification.

Damage due to flooding included streets under water in numerous places such as: Shelburne, Oxford, and Amherst, Nova Scotia as well as Moncton, New Brunswick. Highways were damaged due to washouts or failure of bridges and culverts. At one time, all roads leading from Moncton southward were closed due to flooding or damage. Damage estimates were several million dollars Canadian. The town of Amherst alone reported damages of nearly $2.5 million. Although no lives were lost, ***millions of dollars*** in damage were reported across the Maritimes and Newfoundland.

NOVA SCOTIA

September 24, 1999

- Estimated 150 mm (6 in) of rain in Cumberland County and Annapolis Valley (HH)
- Greenwood received 88.2 mm (3.5 in) of rain (HH)
- South shore and Halifax had between 30–43 mm (1.2–1.6 in) of rain (HH)
- Widespread flooding, countless road closures and flooded basements throughout the province (HH)
- Trans Canada eastbound lanes near Springhill were flooded (HH)
- Flooded Highway 103 near Liverpool (HH)
- Gaspereau River overflowed and forced the closure of Gaspereau Road west of Grand Pre Road (Wolfville) (HH)
- Oxford was almost completely underwater as two rivers overflowed their banks (ET)
- Collapsed bridge on the Wyvern Road near Collingwood (HH)
- Tractor trailer loaded with lumber went off the road at height of the storm in Maccon (HH)
- School closes for the afternoon in Amherst and Windsor gave 5,500 students the afternoon off (HH)
- Closed South Albion Street, Amherst (a main thoroughfare) because of the sewer backups from the runoff (HH)
- Amherst switched to backup water supply because the culverts that carry the main water supply were washed out (HH)
- 1,500 people without power in the Canning area. Power was also lost in Annapolis Valley, Yarmouth, Truro, Westville, Amherst and Stellarton (HH)

September 25, 1999

- Estimated cost of *$3 million* to fix Oxford roads (HH)
- Dozens of homes flooded in Oxford (HH)

- 70% of Oxford was flooded (HH)
- Hardware store flooded in Oxford, *tens of thousands of dollars* of damage (HH)
- Evacuated 15 homes and 30 seniors from seniors complex in Oxford because of the flooding (HH)
- Outside Amherst, waters washed away a culvert leaving a 15 m wide by 20 m deep (50 by 65 ft) hole in the road (HH)
- Women rescued by firemen from a van that was swept into the River Philip (HH)

October 25, 1999

- *$25,000* flood damage to SOS Children's Village in Margaretsville (HH)

NEW BRUNSWICK

September 24, 1999

- Rainfall amounts: Saint John 170 mm (6.8 in), Fredericton 166 mm (6.6 in), Moncton 150 mm (6 in), Miramichi 102 mm (4.1 in), Acadian Peninsula 91 mm (3.6 in), St. Stephen 68 mm (2.7 in), Campbellton 48 mm (1.9 in), Bathurst 51 mm (2 in), and St. Leonard 31 mm (1.2 in) (TJ)
- Flooded basements and roads in the province (TJ)
- Closed causeway connecting Moncton and Riverview (TJ)
- Dieppe called a locate state of emergency because many roads were washed away (TJ)
- Streets flooded in Saint John: McAllister Drive, Rothesay Avenue, Golden Grove Road (TJ)

September 25, 1999

- 27 homes evacuated from West Brook Circle because of flooding in Moncton (TJ)
- *Millions of dollars* of damage in Moncton (TJ)
- West Main, Mount Royal and Horsman Streets closed due to flooding in Moncton (TJ)
- Melanson Settlement Road near Fox Creek closed because of flooding (TJ)
- Pine Glen Road in Riverview closed because of a massive wash out (TJ)
- Via Rail trains closed because a track was washed out near Memramcook, however the passengers were bussed from Amherst to Moncton (TJ)

September 26, 1999

- Four seniors were saved by other travellers on Highway 16 in New Brunswick, just before their car sank into a ditch during the storm (HH)

PRINCE EDWARD ISLAND

September 24, 1999

- Gusts of 117 km/h (63 knots) at East Point (G)
- Charlottetown had 54 mm (2.2 in) of rain (G)
- Prince County had 180 mm (7.2 in) of rain (G)
- Potato fields were swamped, which caused a delay in harvesting the potatoes. Minimal damage to the potato crops (G)
- Major flooding in areas of Summerside (G)
- Greenwood Drive Extension, Harvard, Johnston, Ottawa, Central streets closed in Summerside due to flooding (G)
- Prevented Northumberland ferry from docking in Prince Edward Island, forcing the ferry to return to Nova Scotia (G)
- Restrictions were imposed on Confederation Bridge (G)
- Water came through the telephone and electrical conduit into the mechanical room at Summerside Intermediate School. The power was shut off, however, classes continued (G)

September 25, 1999

- There was *hundreds of thousands of dollars* of damage to roads across the province (G)
- A 55 m (180 ft) bridge in Howlan was washed away (G)

NEWFOUNDLAND

September 25, 1999

- Power outages in St. John's and the Burin Peninsula. 4,500 people without power (ET)
- Traffic lights damaged in St. John's (ET)
- Cracked and uprooted trees across Newfoundland (ET)

1999–Irene

Hurricane Irene originated on October 12, 1999 over the Caribbean Sea. With maximum winds of 176 km/h (95 knots), Irene was classified as a category two hurricane. Hurricane Irene entered the CHC Response Zone on October 18th and moved into Canadian waters that evening as a strong category one hurricane with winds of 148 km/h (80 knots). Irene passed just southeast of Cape Race, Newfoundland. Maximum winds were 98 km/h (53 knots) that gusted to 117 km/h (63 knots) along the east coast of Newfoundland.

Maximum seas were 14.8 m (48.5 ft). Rainfall amounts along the Atlantic coast were within a 30 to 72 mm range. The highest occurred in St. John's where 71.9 mm fell. Power outages and other property damage were reported in Newfoundland. Irene exited the CHC Response Zone on October 20th. The CHC issued 13 Hurricane Information Statements.

NEWFOUNDLAND

October 16, 1999

- St. John's had 106 km/h (57 knots) winds (ET)
- Winds split roof of Aquarena Fitness Centre (ET)
- A few Memorial University buildings closed as a precaution, exams had to be relocated (ET)
- Power outages in St. Johns, Corner Brook, Musgravetown and Codroy Valley (ET)
- Fallen trees caused wires becoming torn from houses in St. John's (ET)
- Search and rescue travelled 500 km (300 mi) to assist three shrimp boats (ET)
- Large piece, 62 by 45 m (200 by 150 ft), of floating dry dock came ashore at Highlands, Bay St. George. The dry dock was being brought from China to Bahamas by two Russian vessels (ET)

October 17, 1999

- Man rescued from a recreational boat after it began taking on water (ET)

October 18, 1999

- Crab plant roof blown off in Fogo (ET)
- Strong winds and a build up of heavy ice cracked off 12 hydro poles in Makkovik (ET)
- Three shrimp boats returned safely after being caught in hurricane force winds on the Belle Island Bank (ET)

QUEBEC

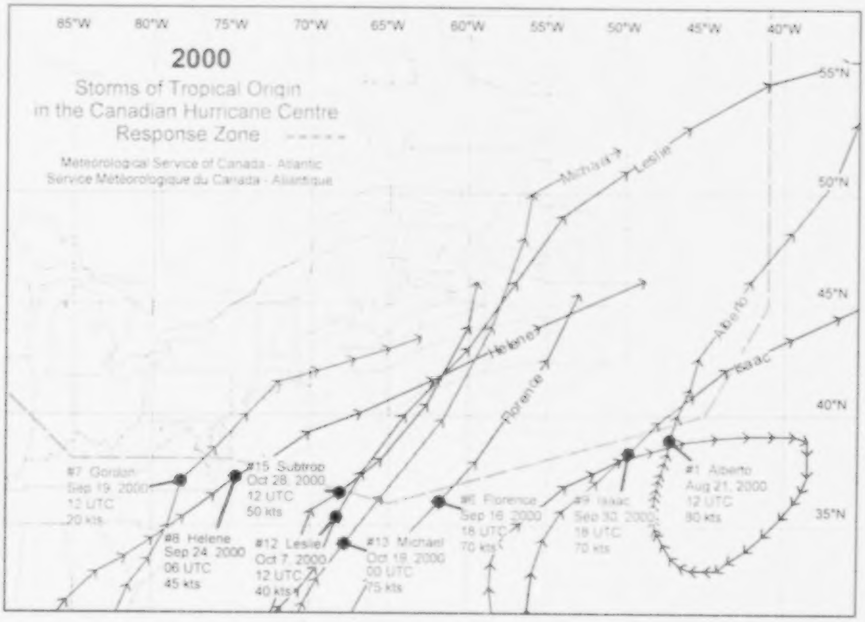
October 16, 1999

- St. Lawrence area had 143 km/h (77 knots) winds (ET)

1999–Jose

Jose originated on October 17, 1999 east of the Barbados with maximum winds of 157 km/h (85 knots). This hurricane had lessened to a tropical storm upon entering the CHC Response Zone on October 25th with winds of 102 km/h (55 knots). Jose remained well out over the sea and did not affect land. Jose left the CHC Response Zone on October 26th. The CHC issued 15 Hurricane Information Statements.

2000 – MAP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2000
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Michael
Leslie
Helene
Florence
Alberto
Isaac
#7 Gordon
Sep 19, 2000
12 UTC
20 kts
#15 Subtrop
Oct 28, 2000
12 UTC
50 kts
#8 Helene
Sep 24, 2000
06 UTC
45 kts
#12 Leslie
Oct 7, 2000
12 UTC
40 kts
#13 Michael
Oct 19, 2000
00 UTC
75 kts
#6 Florence
Sep 16, 2000
18 UTC
70 kts
#9 Isaac
Sep 30, 2000
18 UTC
70 kts
#1 Alberto
Aug 21, 2000
12 UTC
80 kts

2000–Alberto

Alberto originated west of the coast of Africa near Guinea on August 3, 2000, tracked northwest, turned to the northeast west of Bermuda, and entered the CHC Response Zone August 21st southeast of Newfoundland, after executing a clockwise loop. Alberto exited the CHC Response Zone on August 22nd. Maximum winds speeds reported for this storm were 204 km/h (110 knots) and 148 km/h (80 knots) in the CHC Response Zone, while the highest significant wave heights were 12–13 m (40–43 ft). Although no effects were felt over land, strong winds and high seas were experienced over the southeast marine areas of Atlantic Canada. The strongest winds reported in Canadian waters were gusts to 54 km/h (29 knots) at the southwestern Grand Banks buoy. The CHC issued 32 Hurricane Information Statements.

2000–Florence

Florence initiated in the Atlantic Ocean east of Florida on September 9, 2000, tracked southwest, looped to the northeast, and entered the CHC Response Zone on September 16th. Shortly after Hurricane Florence entered the CHC Response Zone, it was downgraded to a tropical storm and it dissipated south of the Avalon Peninsula in Newfoundland on September 17th. Maximum wind speeds recorded in this storm were 130 km/h (70 knots) located inside the CHC Response Zone, however, only Florence was downgraded to a tropical storm with winds of 102 km/h (55 knots) by the time it reached the Grand Banks. Significant wave heights were 7–8 m (23–26 ft). There were no significant effects on land due to this weakening storm. The CHC issued 17 Hurricane Information Statements.

NEWFOUNDLAND

September 18, 2000

- 5 m (16 ft) seas were present off the east coast of the Avalon Peninsula (OC)
- Heavy rain along the Avalon Peninsula (OC)
- Winds were reported to be gusting as high as 93 km/h (50 knots) (OC)

2000–Gordon

Hurricane Gordon formed on September 14, 2000 in the Caribbean east of Mexico's Yucatan Peninsula, crossed the peninsula, headed northeast, made landfall in Florida, and tracked across the eastern seaboard states until heading to sea from Massachusetts. Post tropical storm Gordon entered the CHC Response Zone on September 19th, entered western Maritime waters in the afternoon of the 20th, passed south of Nova Scotia and then became absorbed into a larger area of low pressure near the Maritimes on September 21st. Maximum wind speeds attributed to this storm were 130 km/h (70 knots) but only 55 km/h (30 knots) inside Canadian waters. A peak wind gust at Yarmouth was 59 km/h (32 knots). No significant effects were felt from Gordon. The CHC issued 13 Hurricane Information Statements.

2000–Helene

Helene began east of the Lesser Antilles on September 15, 2000, tracked northwest between Jamaica and Cuba, turned north, made landfall in Florida, turned northeast, crossed the southeastern United States, and headed out to sea off North Carolina. Tropical Storm Helene entered the CHC Response Zone on September 24th, moving into Canadian waters in the afternoon, then followed a northeasterly track over the southern marine waters of Atlantic Canada, dissipating southeast of Newfoundland on September 25th. Maximum wind speeds recorded during the storm's history were 111 km/h (60 knots) inside Canadian waters. Significant wave heights of 6–7 m (20–23 ft) were noted. No significant effects were felt over land. The CHC issued 13 Hurricane Information Statements.

2000–Isaac

Hurricane Isaac initiated south of the Cape Verde Islands west of the coast of Africa on September 21, 2000. Isaac tracked northwest, turned to the northeast west of Bermuda, entered the CHC Response Zone on September 30th, and exited on October 1st, just having grazed the southeast corner of the CHC Response Zone. Maximum winds recorded for the storm was 222 km/h (120 knots), although only 130 km/h (70 knots) within the CHC Response Zone and significant wave heights of 15–16 m (53–56 ft) were assessed. No significant effects were experienced over land. The CHC issued 9 Hurricane Information Statements.

2000–Leslie

Leslie made landfall over Newfoundland as a tropical storm with winds of 74 km/h (40 knots) on October 8th.

Tropical Storm Leslie formed over Florida on October 4, 2000, tracked northeast and entered Canadian waters with official winds of 74-km/h (40-knot) late on the evening of October 7th. Post tropical storm Leslie carried the same winds as it made landfall in Newfoundland near St. Jacques-Coomb's Cove just before noon on October 8th. The storm exited the CHC Response Zone on October 9th. Significant wave heights near 5 m (15 ft) were recorded. Only minor effects were felt from Leslie. Rainfall amounts over eastern Nova Scotia and southern Newfoundland were 25–35 mm (1.0–1.4 in). The CHC issued 10 Hurricane Information Statements.

- Highest sustained inland wind speed 69 km/h (37 knots) at Cape Race, Newfoundland (CHC)
- Highest gusts inland 95 km/h (51 knots) at Sagona Island, Newfoundland (CHC)

2000–Michael

Hurricane Michael made landfall in Newfoundland near Harbour Breton on October 19th, and shortly after transitioned to a post tropical storm. Michael crossed the province and turned east, before dissipating at sea on October 20th. Maximum sustained wind speeds associated with this category two hurricane were 158 km/h (85 knots), noted within the CHC Response Zone and at landfall.

Michael began on October 15, 2000 in the Atlantic Ocean east of Florida, tracked northeast, and entered Canadian waters before noon on October 19th as a category one hurricane with winds of 139 km/h (75 knots). Winds remained at this strength as it made landfall about 60 km west of Harbor Breton, Newfoundland, that evening . . . near the town of François. There were numerous reports of damage from all parts of Newfoundland.

Most of the damage, while light, was due to high winds, and reported from small communities east of where landfall occurred. Damages include: power outages, broken windows, vinyl siding peeled off and shingles torn from roofs. The community of Gaultois, about 60 km east of landfall, appeared to sustain the most damage with dangling power lines, uprooted trees, damaged fences and roofs torn off houses and a hotel. Over water, The Atlantic Elm (a tug) lost its tow with The Portland Star (an unmanned barge) containing 8000 metric tonnes of cement and 10,000 litres of diesel fuel. It was reported to have sunk in Fortune Bay. Pleasure crafts were also damaged or capsized and ferry service between Newfoundland and Nova Scotia was disrupted. The CHC issued 32 Hurricane Information Statements. The CHC issued 28 Hurricane Information Statements.

Noteworthy: Hurricane Michael was the first tropical cyclone into which Canadian scientists (Environment Canada and the National Research Council) flew a research plane.

Some CHC meteorological data with Michael:

- A peak gust of 172 km/h (93 knots) was reported at St. Lawrence, Newfoundland.
- Sagona Island reported a wind speed of 128 km/h (69 knots) with gusts to 150 (81).

- Rainfall amounts to the left of track were in the 35–60 mm (1.4–2.4 in) range with typical amounts of 20–30 mm (0.8–1.2 in) to the right.

- Englee, on the east side of the Northern Peninsula, reported 77 mm (3 in) in rain.

- Rainfall of 45–65 mm (1.8–2.6 in) was also reported over parts of the eastern Maritime Provinces.

- Prior to landfall, significant wave heights were 7–8 m (21–24 ft).

- The peak wave height reported was 16.9 m (53 ft) at Banquereau Buoy 44139.

NEWFOUNDLAND

October 20, 2000

- Winds reported at 160 km/h (86 knots) prior to landfall in Newfoundland, 100 km/h (54 knots) in St. John's (ET)
- In Gaultois, a roof was reportedly lifted from a house in 150 km/h (81 knots) winds (ET)
- Storm ripped siding from the houses in Seal Cove (ET)
- In St. John's power and telephone lines downed by the high winds (ET)
- Ferry service was interrupted (ET)
- In Fortune Bay, a barge was adrift in the bay (ET)
- In Corner Brook, a tree fell on a van disrupting power service in the area (ET)
- In Conception Bay South, a Sobeys store had broken windows because of high winds related to the storm (ET)

2000–Subtrop

An unnamed tropical cyclone originated east of the Turks and Caicos in the Atlantic Ocean on October 25, 2000, traveled north, and entered the CHC Response Zone on October 28th. The storm entered Canadian waters in the early morning hours of October 29 with winds of 102 km/h (55 knots) and then tracked northeast as it underwent transition to become a more fully extratropical storm. By the afternoon of the 29th the storm centre was located just south of Cape Breton, Nova Scotia, where it stalled and remained for more than a day bringing a prolonged period of northeast winds across the Gulf of St. Lawrence. This turned out to be the most damaging storm of the year for Atlantic Canada. Record storm surge and near-record water levels occurred along eastern New Brunswick and northern Prince Edward Island causing extensive coastal flooding and damage. **Fishermen in PEI reported this to be the worst storm that they seen in**

more than 30 years. The end result was extensive and damaging coastal flooding costing in the tens of millions of dollars.

Some CHC meteorological data with this post-tropical storm:

- Maximum wind speeds reached 72 km/h (39 knots) with a peak (local) wind of 84 km/h (45 knots) over the Cape Breton Highlands.
- The peak speed recorded over land was a gust to 165 km/h (89 knots) at Burgeo, Newfoundland.
- Maximum wave in the Gulf of St. Lawrence were measured near 14 m (46 ft) . . . nearly unprecedented.
- Storm surge of near 1.6 m (5.2 ft) was reported along the north coast of Prince Edward Island and the southeast coast of New Brunswick.
- Significant rainfalls occurred over Cape Breton with 98.0 mm (3.9 in.) reported from Sydney and over 160 mm (6.3 in.) reported from a climate station.

NOVA SCOTIA

October 30, 2000

- Cabot Trail–Sections of the Cabot Trail that run through Neils Harbour, White Point, Ingonish harbour, and Black Brook were closed due to flooding (HH)

October 31, 2000

- Neils Harbour and New Haven–roads were washed out and a fish plant was damaged by high seas–estimated cost of damage at the Victoria Co-op Fisheries Ltd. was *$40,000* (HH)

NEW BRUNSWICK

October 30, 2000

- Point-du-Chene–streets were closed because of high winds and storm surge (HH)
- Miramichi Bay–damage to wharves (HH)
- 100 km (62 mi) stretch of the New Brunswick coastline lost power–7,000 people effected (HH)

PRINCE EDWARD ISLAND

October 30, 2000

- Peak winds > 100 km/h (54 knots)–North Cape maximum recorded wind of 118 km/h (64 knots) (G)
- 30–60 mm (1.2–2.4 in) of rain were recorded in the province (G)
- High winds and high tides closed bridges, washed out roads and complicated highway travel (G)
- Fishing boats docked in harbour sustained damage–in Foxley River boats were swamped forcing them to sink (G)
- Fallen trees, roofing shingles, and eroded sediment was scattered around the province (G)
- Foxley River–erosion of the banks of the river damaged to trailers parked there from the effects of wind and water (G)
- Cascumpec and Oyster Bed Bridges sustained damage (G)
- Falling trees and branches were responsible for scattered power outages (G)
- Tory Road Bridge, The Dawson Bridge and the bridge in Springbrook, were closed (G)

October 31, 2000

- At East Point winds were measured up to 120 km/h (65 knots) and at North Point measured rainfall was 61 mm (2.4 in) (G)
- Waves 11 m (36 ft) high were measured north of Rustico (G)
- Erosion of the shoreline caused by high winds and waves (G)
- Erosion caused damage to highways–eight sites in total. These include: areas in West Prince on Route 12 and on side roads off Route 12. In New London, on Route 20 there was several sites damaged and on Route 6. There were some other cases of damage in the Souris area (G)
- Bases of bridges in Cascumpec, Oyster Bed and New London eroded by wave action–closed at night for safety reasons (G)
- Jacques Cartier Provincial Park near Alberton, sustained some erosion damage to its camping sites (G)
- Cedar Dunes Provincial Park in West Point, lost a wheelchair access to the beach (G)
- Winds in the Stanley Bridge harbour reached 110 km/h (60 knots) during the storm (G)
- Water levels had risen about 1.5 m (5 ft) (G)

November 2, 2000

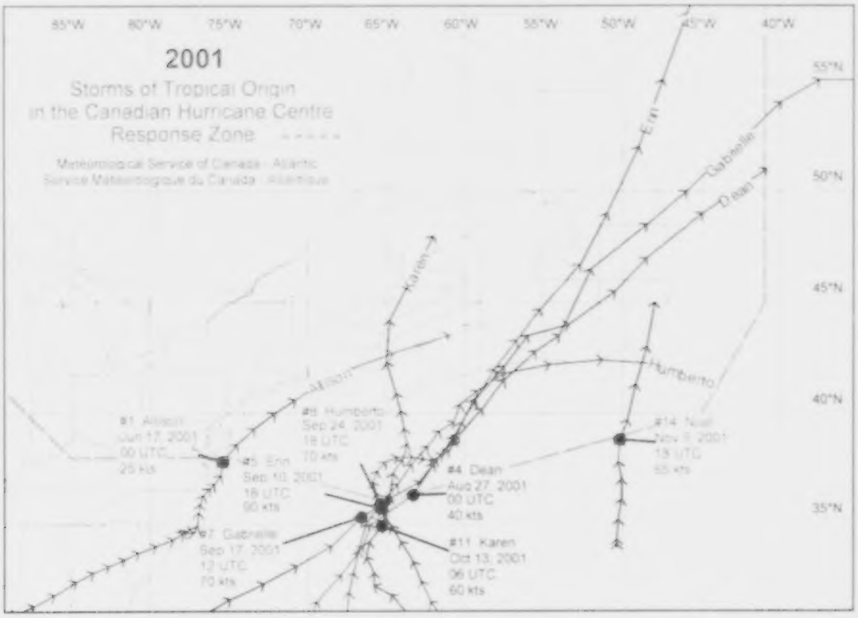
- The storm dumped thousands of pounds of lobsters along the coast of the province–could effect the lobster population because the lobsters were not able to lay their eggs (HH)

NEWFOUNDLAND

October 31, 2000

- Winds reached 168 km/h (91 knots) in Wreckhouse, 165 km/h (89 knots) in Burgeo, and 141 km/h (76 knots) in Corner Brook (ET)
- In Rocky Harbour, winds peaked at 115 km/h (62 knots) and signs were damaged in the high winds including one that had to be removed with a boom truck (ET)
- In Stephenville, a house under construction was blown from its foundation, trees, fences, and buildings were damaged (ET)
- Corner Brook lost power for several hours when a tree fell across power lines (ET)

2001 – MAP


85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
40°W
55°N
50°N
45°N
40°N
35°N
2001
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Erin
Gabrielle
Dean
Karen
Allison
Humberto
#1 Allison
Jun 17, 2001
00 UTC
25 kts
#8 Humberto
Sep 24, 2001
18 UTC
70 kts
#5 Erin
Sep 10, 2001
18 UTC
90 kts
#4 Dean
Aug 27, 2001
00 UTC
40 kts
#14 Noel
Nov 5, 2001
18 UTC
55 kts
#7 Gabrielle
Sep 17, 2001
12 UTC
70 kts
#11 Karen
Oct 13, 2001
06 UTC
60 kts

2001–Allison

Tropical Storm Allison began on June 5, 2001 in the Gulf of Mexico and carried maximum sustained winds of 92 km/h (50 knots). Allison entered the CHC Response Zone on June 17th and Canadian waters the next day, however, it was weakening at this point and carried winds reaching 72 km/h (40 knots). Weakening even more, Allison remained in Canadian waters for two days and diminished on June 19th without causing any damage in Canada.

2001–Dean

Tropical Storm Dean originated off the Lesser Antilles on August 22, 2001. Only developing into a tropical storm, Dean sustained winds as high as 111 km/h (60 knots) within the CHC Response Zone. Moving northeastward, Dean crossed the Grand Banks marine areas near Newfoundland and passed about 250 km southeast of Cape Race during the morning hours of August 28. Thereafter, Dean weakened as it moved out over the north Atlantic. Hurricane Dean left the CHC Response Zone, diminished on August 29th, and did not result in any damage to Canada. This was the first of 4 tropical cyclones within a span of a month that brought over 100 mm of rain to portions of Newfoundland as it passed southeast of the province. The CHC issued 6 Hurricane Information Statements.

Some CHC meteorological data:

- Rainfall amounts, from the evening of the 27th until midday on the 28th, ranged from 10 to 20 mm over central Newfoundland to 107 mm at Bonavista.
- Maximum wind gust recorded in Canadian waters 80 km/h (43 knots) at Buoy 44140 (which also recorded 5.7 m significant wave heights)

2001–Erin

Hurricane Erin began on September 1, 2001 west of the Cape Verde Islands. Erin developed into a category three hurricane and created winds as high as 194 km/h (105 knots). Upon entering the CHC Response Zone on September 10th, Erin was a category two hurricane and brought winds up to 166 km/h (90 knots). Erin left the CHC Response Zone on September 16th and diminished on September 17th. Erin caused delays in the ferry between Newfoundland and Nova Scotia. Canadian plans to fly a research aircraft into the eye of Erin on September 11 were cancelled when all air traffic was grounded due to terrorist attacks on the United States. The CHC issued 32 Hurricane Information Statements.

Some CHC meteorological data:

- Maximum wind speeds were estimated at 130 km/h with significant wave heights of 9.3 m.
- The strongest recorded wind ahead of Erin was an easterly gust of 96 km/h at Cape Race. Behind the storm, over coastal areas, maximum gusts reached 107 km/h at Cape Race and Bonavista.
- The maximum recorded wave height (Nickerson buoy, 44251) was 14.4 m.
- Heavy rainfalls were also reported over portions of Newfoundland. Sagona Island, along the south coast, recorded 131 mm.

NEWFOUNDLAND

September 16, 2001

- High winds and rough seas forced Marine Atlantic to cancel its ferry service between North Sydney, Nova Scotia and Argentia, Newfoundland (HH)

2001–Gabrielle

Hurricane Gabrielle developed off the west coast of Florida in the Gulf of Mexico on September 11, 2001. Gabrielle became a category one hurricane, and contained winds reaching 129 km/h (70 knots). Gabrielle transitioned into a post-tropical storm as it was moving through Canadian waters and passed south of Newfoundland where it flooded many areas of St. John's and the Avalon Peninsula. **The storm was declared to be "the worst storm in 100 years," by the mayor of St. John's.** Many houses in St. John's were flooded, roads were washed away, and the Avalon Mall along with its parking lot was flooded. Also, schools in the area were closed due to damage. Gabrielle was atypical in that the region of greatest winds were spread to the northwest of the storm centre, resulting in widespread gusts in excess of 100 km/h along the south and east coasts of Newfoundland. Gabrielle left the CHC Response Zone on September 20th and diminished on September 21st. The CHC issued 17 Hurricane Information Statements.

- Province received ***$1.2 million*** in Disaster Financial Assistance from the federal government for Luis in 1995 and Gabrielle in 2001 (CSC)

Some CHC meteorological data:

- Cape Race recorded a maximum sustained wind of 106 km/h and a maximum gust of 130 km/h. The highest reported sustained wind was 107 km/h at the Hibernia oil rig.
- Highest reported sea states showed significant wave heights between 7.9 m and 9.1 m. The highest wave height reported was 15.1 m at Laurentian Fan buoy (44141).
- Record rainfalls were reported over eastern Newfoundland with Gabrielle. Official reports ranged from 2 mm at Gander to 161.5 mm at Cape Race. Memorial University of Newfoundland reported 175 mm.
- Much of the rain fell within a 6 hour period or less and an agricultural station in St. John's (St. John's West) recorded 89.9 mm breaking its 6-hour rainfall record by 10 mm. The 118.6 mm that fell at St. John's Airport came within 2.6 mm of breaking its 24-hour record. Intense hourly rainfall rates included 48 mm at Cape Race and 27 mm at St. John's west.

NEWFOUNDLAND

September 20, 2001

- Winds peaked at 70 km/h (38 knots) (ET)
- Cape Race recorded winds of 130 km/h (70 knots) (ET)
- A home on East Meadows Avenue was flooded with approximately 2 m (6.5 ft) (ET)
- Kenmount Road, Southside roads, Bonaventure Avenue, The Boulevard, Waterford Bridge Road, Portugal Cove Road, Newfoundland Drive, Prince Philip Parkway, Poplar Avenue, and Allandale Road were all closed (ET)
- Jordan Place in Shea Heights was flooded (ET)
- The west entrance to the Health Sciences Centre was closed (ET)
- 15 schools were closed due to leaky roofs or flooding (ET)
- Canadian Post cancelled all mail delivery services due to dangerous road conditions (ET)
- Carnell Drive was flooded and the Anglican Cemetery and Boathouse near Quidi Vidi Lake was flooded (ET)
- Petty Harbour Road was flooded and resembled a ravine (ET)
- Roads leading to Bauline were washed out (ET)
- Pitts Memorial Drive, Torbay Road, and Route 10 near Tucken Bush River were flooded (ET)

September 21, 2001

- 119 mm (4.8 in) of rain fell in St. John's from the storm (ET)
- Three homes were flooded in a cul-de-sac near Blackmarsh Road. Personal items were destroyed and rooms in their houses ruined (ET)
- The Avalon Mall parking lot was severely flooded and 45 stores were flooded (ET)
- Roads from Blackhead Road to Shea Heights were closed (ET)
- Virginia River over flowed causing flooding to Newfoundland Drive (ET)
- 586 calls to the city of St. John's were taken in relation to the storm (ET)
- The heavy rain caused damage to Holy Trinity High School in Torbay (ET)

September 24, 2001

- Damage to many Shea Height homes (ET)

2001–Humberto

Hurricane Humberto developed north of the Lesser Antilles and strengthened into a category two hurricane. Humberto's life spanned from September 21st to September 27, 2001 and it entered the CHC Response Zone on September 24th, turning eastwards shortly thereafter. Consequently, Humberto had minimal effects on Canadian land. Over seas, however, maximum winds were estimated at 167 km/h (90 knots)…a solid category 2 hurricane on the Saffir-Simpson Hurricane Scale. Due to the direction in which Humberto traveled, highest significant waves (estimated in the 12 to 14 m range) were outside the Canadian marine district. Lasting for three days in the CHC Response Zone, Hurricane Humberto diminished on September 27th and did not cause any damage in Canada. The CHC issued 22 Hurricane Information Statements.

2001–Karen

Tropical Storm Karen made landfall near Liverpool, in Nova Scotia, during the late morning hours of October 15th.

Hurricane Karen began of October 11, 2001 in the mid-Atlantic, south of Bermuda. Sustaining winds of 129 km/h (70 knots), Karen was a category one hurricane within the CHC Response Zone after it entered on October 13th. High winds and rain were experienced in Nova Scotia, and several power outages were reported. Karen survived in the CHC Response Zone for two days before it dissipated on October 15th. Canadian research scientists flew their second data-gathering mission into a tropical cyclone by flying into Karen just prior to its landfall in Nova Scotia. The CHC issued 17 Hurricane Information Statements.

Some CHC meteorological data:

- Maximum wind speeds at landfall were near 83 km/h.
- The maximum winds were recorded at Grand Étang (in the Cape Breton Highlands) which reported 91 km/h (49 knots) with gusts to 124 km/h (67 knots).
- Elsewhere, maximum gusts of 104 km/h were recorded at McNabs Island near Halifax, as well at Cape George, Antigonish County, Nova Scotia.
- Maximum rainfall amounts were not significant, however, the 46.0 mm that were reported from Yarmouth fell in a matter of a few hours.

NOVA SCOTIA

October 16, 2001

- Wind of 96 km/h (52 knots) was recorded on McNabs Island in Halifax harbour (HH)
- Winds of 89 km/h (48 knots) were felt on the northeast coast of Nova Scotia (HH)
- Halifax reported 10 mm (0.4 in) of rain (G)
- 45 mm (1.8 in) of rain reported in Yarmouth (HH)
- Halifax, Dartmouth, Lower Sackville, and Guysborough had short power outages (HH)
- Power outages were reported in Truro, where 1,500 customers lost their power (HH)

NEW BRUNSWICK

October 16, 2001

- The west end of Prince County was estimated to have received only 15 mm (0.6 in) of rain (G)

PRINCE EDWARD ISLAND

October 16, 2001

- Charlottetown reported 1 mm (0.03 in) of rain (G)
- 7 mm (0.3 in) of rain was reported in Summerside (G)
- 15 mm (0.6 in) of rain was estimated to have fallen in O'Leary (G)
- The Prince Edward Island – Nova Scotia Ferry was cancelled (HH)

2001–Noel

Hurricane Noel began on November 4, 2001 in the mid-Atlantic Ocean. Bringing winds of 120 km/h (65 knots), Noel was classified as a category one hurricane. It entered the CHC Response Zone on November 5th at its maximum strength but then weakened before entering Canadian waters near noon on the 6th. Maximum wind speeds while in Canadian waters were estimated at 93 km/h. The high winds and rain caused by Hurricane Noel created havoc in the Atlantic Provinces. It flooded streets, created power outages, and knocked down trees. Flights and ferry services were also delayed or cancelled. Lasting for only two days, Hurricane Noel dissipated on November 6th. The CHC issued 5 Hurricane Information Statements.

NOVA SCOTIA

November 8, 2001

- Winds were blowing as strong as 119 km/h (64 knots) northern Nova Scotia and Cape Breton (HH)
- Several flights were cancelled from Halifax International Airport (HH)

November 9, 2001

- Winds gusted to 125 km/h (67 knots) off Cape George in Guysborough County (HH)
- Pleasant Bay received winds as high as 115 km/h (62 knots) (HH)
- Winds at 130 km/h (70 knots) at Canso combined with the heavy seas ripped large pieces out of the causeway (ET)
- Winds up to 150 km/h (81 knots) knocked down power lines and trees, and damaged causeways (ET)
- 30–40 mm (1.2–1.6 in) of rain fell in Inverness County causing flooding, damaging wharfs and battering vessels (HH)
- 30 mm (1.2 in) of rain fell in many parts of Nova Scotia (ET)
- Waves were recorded to have reached a height of 8 m (26 ft) in northwest Nova Scotia (HH)
- The Canso causeway was also closed due to 9 m (29 ft) waves (ET)
- In Abercombie, a town near New Glasgow a shed was being blown down a road (HH)
- In Pictou, a steel roof was blown off a mini-mall (HH)
- A transport truck was blown over near the Canso causeway (ET)
- About 70,000 homes were without power in Nova Scotia (ET)

PRINCE EDWARD ISLAND

November 8, 2001

- Winds were blowing as strong as 119 km/h (64 knots) in Prince Edward Island (HH)
- Boats in Prince Edward Island were swamped (HH)

November 9, 2001

- Winds of 145 km/h (78 knots) pounded the islands north shore (ET)

- Winds gusted to 155 km/h (84 knots) on Confederation Bridge causing it to close for four hours (ET)
- Bridges in Margaree Harbour and French Chapel were blocked and flooded (ET)
- Prince Edward Island was lashed by high storm surges. It submerged some wharfs and coastal roads (ET)

NEW BRUNSWICK

November 9, 2001

- About 20 mm (0.8 in) of rain fell in New Brunswick (ET)
- About 40,000 homes were without power in the Fredericton area (ET)

NEWFOUNDLAND

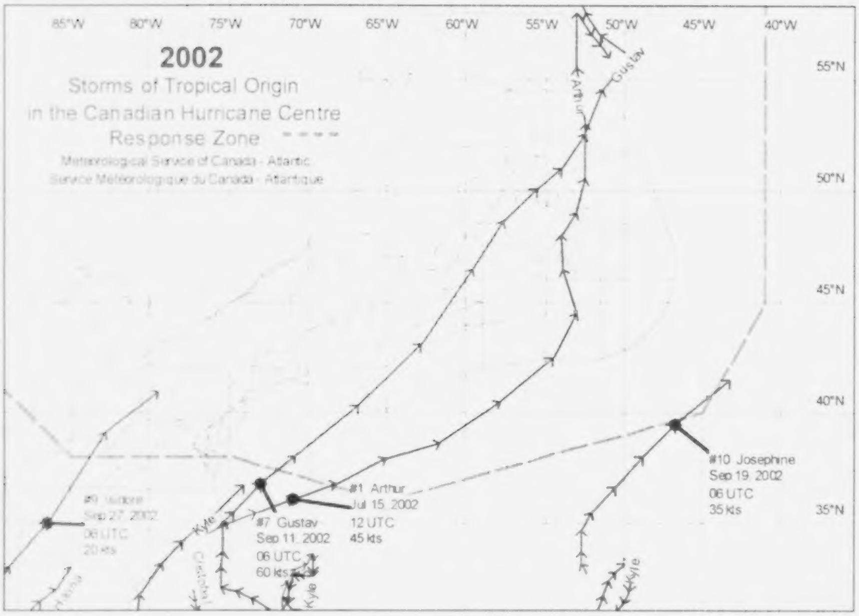
November 8, 2001

- Winds gusted to 110 km/h (59 knots) (ET)
- High winds blew out windows from eight cars at a high school in Mount Pearl (ET)
- The storm forced Marine Atlantic to cancel its ferry service and flights at St. John's International Airport were delayed (ET)
- A roof was blown off a transport truck near the Canso crossing (ET)
- The high winds tore four metal panels about 1.5 by 3 m (5 by 10 ft) from an overhead walkway connecting the Aquarena and the Memorial University's Field House (ET)
- The Aquarena in St. John's was shutdown (ET)
- Westerland Road was also closed in St. John's (ET)

November 9, 2001

- Environment Canada's monitoring equipment in Holyrood had its dome blown off by the high winds (ET)

2002 – MAP


85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
40°W
55°N
50°N
45°N
40°N
35°N
2002
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Météorologique du Canada - Atlantique
Arthur
Gustav
#1 Arthur
Jul 15 2002
12 UTC
45 kts
#7 Gustav
Sep 11 2002
06 UTC
60 kts
#10 Josephine
Sep 19 2002
06 UTC
35 kts
#9 Isidore
Sep 27 2002
06 UTC
20 kts
Kyle
Cristobal
Hanna
Kyle
Kyle

2002–Arthur † (1 Canadian fatality)

Tropical Storm Arthur developed off the east coast of North Carolina on July 14, 2002. Arthur only developed into a tropical storm. It entered the CHC Response Zone on July 15th at its maximum strength and then entered the Grand Banks waters on the afternoon of the 16th. Arthur continued northward, making landfall in Newfoundland near dawn on the 17th as a post-tropical storm with winds of 83 km/h (45 knots). **One man drowned off the coast of Newfoundland when his boat was swamped by the high seas.** Arthur also played havoc with Marine Atlantic's Ferry Services. On July 19th, Tropical Storm Arthur dissipated. The CHC issued 15 Hurricane Information Statements.

NEWFOUNDLAND

July 17, 2002

- Marine Atlantic changed its ferry schedule due to the storm (ET)

July 19, 2002

- In Conne River, a man drowned when his boat was capsized by a wave during their return trip from a fish farm. The other crewmember was able to swim ashore (ET)

2002–Gustav † (1 Canadian fatality)

Hurricane Gustav originated on September 8, 2002 midway between the coast of Florida and Bermuda. It developed into a category two hurricane, carrying winds of 157 km/h (85 knots). Gustav entered the CHC Response Zone on September 11th, moving into Canadian waters in the afternoon as a category one hurricane, maintaining hurricane strength through to landfall after midnight near St. Esprit Island on the south coast of Cape Breton. Reports of heavy rain, high winds, and minor flooding from storm surge were received from around Atlantic Canada in the wake of the storm. **One man was killed in Prince Edward Island in a storm-related automobile accident**. Many power outages were reported, trees were broken and several car accidents occurred due the storm. Hurricane Gustav was the first hurricane to make landfall in Nova Scotia since Hurricane Hortense in 1996. Gustav diminished on September 15th. The CHC issued 18 Hurricane Information Statements.

Gustav was the first landfalling hurricane in Canada to be captured on Doppler radar, passing only 20-30 km southeast of the newly installed Doppler site at Marion Bridge, N.S. (installed June 2002). The Doppler data indicated that Gustav was in transition between its tropical and extratropical phases.

Some CHC meteorological data:

- The highest recorded rainfall was 102 mm in Ashdale, N.S. (all Nova Scotia sites received at least 50 mm).
- Highest reported wind speeds were 122 km/h from both St. Paul Island and Sable Island, N.S.
- Storm surges throughout the southern Gulf of St. Lawrence coincided (within a few hours) of a run of high astronomical tides, resulting in localized coastal flooding. A noteworthy point for water levels in Charlottetown, P.E.I., is that had the highest surge arrived 4 hours earlier to coincide exactly with the highest tide, an additional 70 cm of elevation would have pushed levels to 210 cm—near record values that would have resulted in flooding portions of that city.

NOVA SCOTIA

September 12, 2002

- Winds over 100 km/h (54 knots) hit the eastern part of Nova Scotia (GM)
- Some areas of Nova Scotia received over 60 mm (2.4 in) of rain (GM)
- Power was knocked out in Cape Breton (GM)
- Power outages occurred in the central and north end of Halifax (HH)
- Outages were reported from Agricola Street to the dockyards and from Cornwallis Street to Livingstone Street (HH)

September 13, 2002

- Pictou received 110 mm (4.4 in) of rain during the storm (G)
- Ashdale in west Hants County received 102 mm (4.1 in) of rain (HH)
- 4,000 customers in Halifax lost power (G)
- 1,500 customers between Stellarton and the New Brunswick border were without power (G)
- Thousands of people were without power in Cape Breton (HH)
- The first category one hurricane to make landfall since 1996 (HH)
- Power outages in the Broad Cove area affected 900 customers (HH)
- Power was also out in Weymouth (HH)
- A road between East Wallace and Malagash had a 30 m (98 ft) portion of the shoulder washed away (HH)
- Minor flooding in parts of northern mainland Nova Scotia (HH)
- Parts of the shoreline were eroded (HH)

NEW BRUNSWICK

September 12, 2002

- Heavy rain was experienced in southern New Brunswick (GM)

PRINCE EDWARD ISLAND

September 12, 2002

- Power was lost in Prince Edward Island (GM)

September 13, 2002

- One man was killed and another injured in a vehicle accident during the height of the storm. It is believed that the heavy wind and rain played a part in the accident (G)

- Winds were measured at 96 km/h (52 knots) in Charlottetown and 91 km/h (49 knots) (G)
- East Point measured winds as high was 109 km/h (59 knots) and North Cape measured winds as high as 104 km/h (56 knots) (G)
- Charlottetown received 61 mm (2.4 in) of rain (G)
- Summerside received 39 mm (1.6 in) of rain (G)
- High winds and heavy rain hit Prince Edward Island but damage was not as significant as expected (G)
- Numerous trees had broken and fell down, and short power outages were common across the island (G)
- The Confederation Bridge placed restrictions on passing of certain vehicles during the storm (G)

QUEBEC

September 12, 2002

- Heavy rain was experienced on Iles-de-la-Madeleine (GM)

NEWFOUNDLAND

September 12, 2002

- Wind pounded the southern and western part of Newfoundland with winds gusting to 110 km/h (59 knots) (GM)

September 13, 2002

- Winds in St. John's were reaching 70 km/h (38 knots) (G)
- Winds in excess of 118 km/h (64 knots) in Newfoundland (ET)
- In St. Lawrence, wind gusted as high as 122 km/h (66 knots) (ET)
- Deer Lake received 47 mm (1.9 in) of rain while Stephenville received 18 mm (0.7 in) of rain (ET)
- Burgeo reported that 69 mm (2.7 in) of rain fell in the area (ET)
- The Avalon Peninsula reported high winds, however little rain was reported (ET)
- Power was out in Corner Brook, Birchy Bay, Comfort Cove, Loon Bay, and Michael's Harbour (ET)
- The Trans Canada Highway was washed out near Birchy Lake (ET)
- Marine Atlantic cancelled several ferry runs because of the weather (ET)
- Several car accidents reported on the Trans Canada Highway, plus several in the Marble Mountain area (ET)
- Fallen trees caused many local power outages (ET)
- Power lines were down on Aspen Avenue in Cormack (ET)

- A power line was down on Maryland Drive in Stephenville (ET)

September 20, 2002

- A Welsh boat called *Spirit of Cardiff* was swamped in St. John's harbour during the storm (HH)

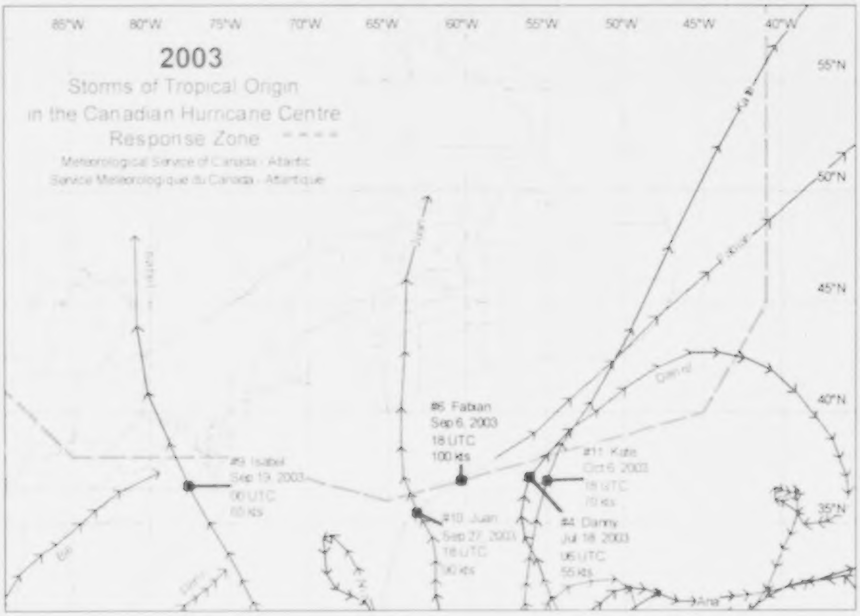
2002–Isidore

Hurricane Isidore began on September 14, 2002 off the north coast of Venezuela. Isidore strengthened into a category three hurricane and brought winds of 203 km/h (110 knots). It entered the CHC Response Zone on September 27th as a tropical depression, bringing winds of 37 km/h (20 knots) to the region. Isidore diminished later that same day without resulting in any damage in Canada. Isidore was predominantly a rain event for southern Ontario and Québec and portions of the Maritimes. Rainfall amounts were moderate with locations from southwestern Ontario through much of Atlantic Canada reporting between 25-35 mm. The CHC issued 1 Hurricane Information Statement.

2002–Josephine

Tropical Storm Josephine originated in the mid-Atlantic on September 17, 2002. Josephine only gained tropical storm status and entered the CHC Response Zone at its maximum strength carrying winds of 92 km/h (50 knots). Josephine left the CHC Response Zone and dissipated on September 19th. Josephine was not responsible for any damage reported in Canada.

2003 – MAP


85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
40°W
55°N
50°N
45°N
40°N
35°N
2003
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
Isabel
Juan
Kate
Fabian
Danny
#6 Fabian
Sep 6, 2003
18 UTC
100 kts
#9 Isabel
Sep 19, 2003
00 UTC
60 kts
#11 Kate
Oct 6, 2003
18 UTC
70 kts
#10 Juan
Sep 27, 2003
18 UTC
90 kts
#4 Danny
Jul 18, 2003
06 UTC
55 kts
Ana

2003–Danny

Tropical Storm Danny was in the CHC Response Zone July 18–20 and was upgraded to a category one hurricane during that time. The storm centre never entered Canadian waters and as a result tropical storm force winds were not reported from Canadian waters. The CHC issued 13 bulletins.

2003–Fabian

Hurricane Fabian was in the CHC Response Zone September 6–8. Fabian was a category one hurricane of 130 km/h (70 knots) when it moved through the eastern edge of the Southeastern Grand Banks. No data was obtained from Canadian waters during Fabian's passage, however, the CHC estimates that significant wave heights in excess of 20 m (65 ft) may have occurred just outside Canadian waters. Three lives were lost when the vessel, *The Pacific Attitude*, sank in the vicinity of the highest waves. The vessel was just outside Canadian waters when it signaled distress. The CHC issued 24 bulletins.

NEWFOUNDLAND

September 3, 2003

- Winds up to 190 km/h (103 knots) were produced when Fabian entered Canadian waters (TDN)

September 9, 2003

- Three lives were lost when the 23 m (75 ft) yacht – *Pacific Attitude* sank just outside the Southeastern Grand Banks marine area (HDN)
- The last position of the yacht when it went down was 42°15' N, 49°58' W (CCG)

September 10, 2003

- Maximum wave heights reached 22–28 m (72–92 ft) and significant wave heights reached 12–15 m (39–49 ft) where the yacht went down (CHC)

2003–Isabel † (1 Canadian fatality)

Tropical Storm Isabel entered Ontario near noon September 19 with winds gusting to 73 km/h (39 knots) and rainfalls of 30-50 mm near and west of the storm track.

After having reached category 5 strength in the Atlantic, Isabel weakened dramatically before landfall in the Carolinas. Following landfall the storm was downgraded to a tropical storm as it entered the CHC Response Zone at midnight September 18-19. Isabel subsequently entered the province of Ontario via Lake Erie near noon that same day. Winds of 55 gusting 73 km/h (30 gusting to 39 knots) were reported in numerous locations in southern Ontario, along with rainfalls of 30–50 mm (1.2–2.0 in) near and west of the storm track. Wave heights in western Lake Ontario reached near 4 m (13 ft) because of strong easterly winds ahead of the storm. Damage reports included numerous power outages, fallen trees, and some localized flooding. The CHC issued 22 bulletins.

Noteworthy: Isabel was a storm of unprecedented predictability, with "accurate" forecasts being issued as much as a week earlier. With the storm being so newsworthy for such a long time before it arrived, and also due to a September 14 news story warning that conditions were "ripe" for Isabel to be a repeat of Hurricane Hazel (1954), Isabel became the most intense media event in the 15^{+}-year history of the CHC, with the Hurricane Centre conducting more than 200 interviews in a span of five days.

Noteworthy: Isabel became the 3rd tropical cyclone (1st inland) to be flown by Canadian researchers. For more information consult the CHC website: http://www.atl.ec.gc.ca/weather/hurricane/isabel/index.html

ONTARIO

September 20, 2003

- A woman passenger was killed on County Road 4 when a truck lost control north of Odessa due to wet road conditions (KWS)
- Point Pelee – more than 53 mm (2.1 in) of rain fell (KWS)
- Toronto – close to 30 mm (1.4 in) of rain fell (TS)
- Winds gusted to more than 50 km/h (27 knots) in Kingston (KWS)
- 70 km/h (38 knots) winds gusted east of the storm centre (HDS)
- Hydro One reported 27,000 households lost power due to tree limbs falling on power lines, with 12,000 in the Toronto area (HDS)
- Schools were shut down in the Halton district (HDS)
- Waves built to 4 m (13 ft) on Lake Ontario (CHC)

QUEBEC

September 20, 2003

- No damage or effects from the storm were reported and the storm was severely downgraded to a low pressure system by the time it arrived (MG)

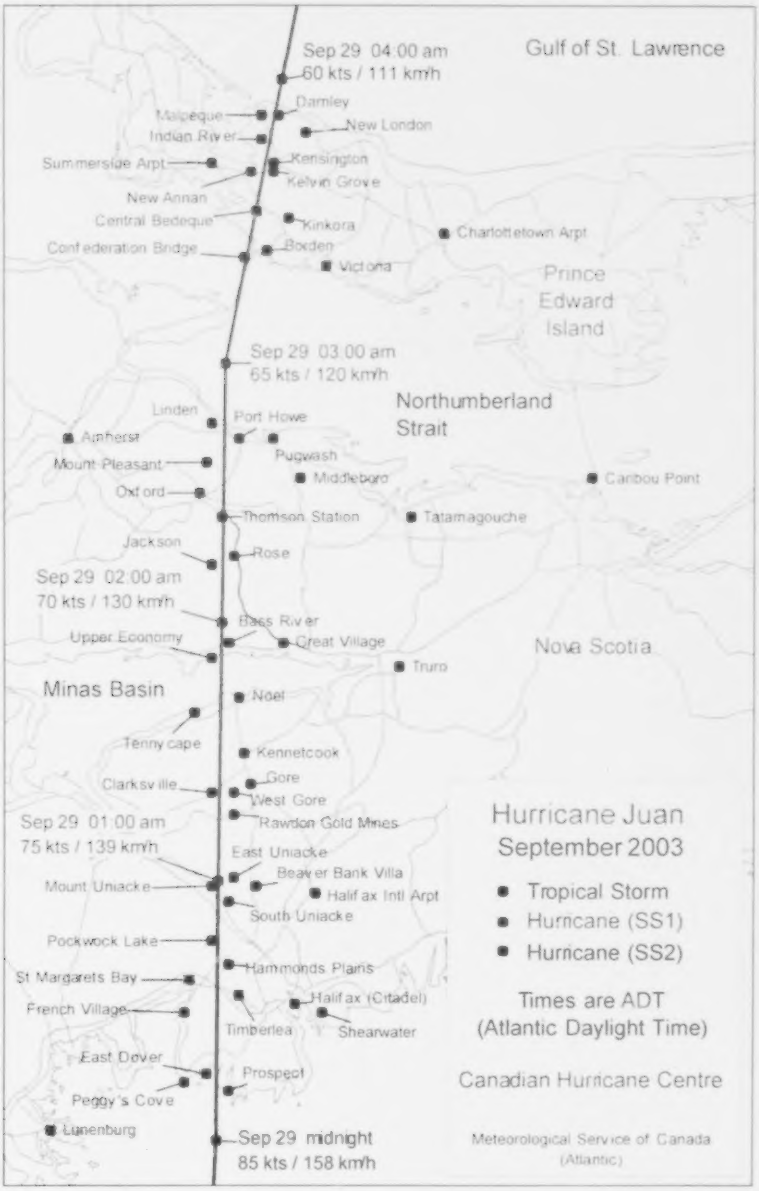
2003–Juan † (8 Canadian fatalities)

Hurricane Juan—a category two hurricane with 158-km/h (85-knot) winds—made landfall near Prospect, Nova Scotia (just west of Halifax) at 12:10 a.m. ADT, on September 29th. Less than three hours later it made landfall in Prince Edward Island as a category one hurricane. Because of the impact of Hurricane Juan on the Maritimes, the CHC developed a dedicated website shortly after the storm in order to provide updated information to Canadians:
http://www.atl.ec.gc.ca/weather/hurricane/juan/

Juan began as Tropical Depression #15 about 470 km (292 mi) southeast of Bermuda at noon ADT, Thursday September 25. Six hours later it was upgraded to Tropical Storm Juan, and 24 hours after being declared a tropical depression, Juan became a hurricane 255 km (158 mi) east of Bermuda.

Hurricane Juan entered the CHC Response Zone on the evening of September 27th as a category two hurricane and remained at that strength as it moved through the West Scotian Slope, LaHave Bank, and Southwestern Shore marine areas. It remained at category two strength when it made landfall near Prospect, Nova Scotia (just west of Halifax) at 12:10 a.m. ADT, on September 29th. Less than three hours later it made landfall in Prince Edward Island as a category one hurricane. Juan passed directly over the Confederation Bridge joining the provinces of Prince Edward Island and New Brunswick.

The strongest one minute sustained winds reported were 158 km/h (85 knots) at McNabs Island in Halifax harbour. The highest peak gust reported was 232 km/h (125 knots) at the 20 m (66 ft) level) from the vessel Earl Grey while at anchorage in the Bedford Basin at the head of the Halifax harbour. Doppler radar from Gore, NS, recorded highest winds of 213 km/h (115 knots) at 1 km (0.6 mi) above the ground. Hurricane force gusts extended 160 (100 mi) [20] (12 mi) km east [west] of Juan at landfall and 110 (68 mi) [0] (0 mi) km east [west] of the storm as it exited Nova Scotia less than three hours later. Rainfall with Juan was considerably low, with the highest official accumulation of 38 mm (1.5 in) at Halifax International Airport. A subsequent tropical-like weather feature following 8–10 hours after Juan gave an additional 30–40 mm (1.2–1.6 in). The two events combined to give localized flooding. The storm surge near and just east of Halifax was estimated at near 2 m (6.5 ft), establishing a new record water level at Halifax. Buoy 44258 at the mouth of Halifax harbour recorded a significant wave height (HSIG) of 9.0 m (29.5 ft) and a maximum wave height (HMAX) of 19.9 m (65.5 ft). The LaHave Bank buoy 44142 measured HSIG of 12.2 m (39.5 ft) and HMAX of 26.0 m (85.4 ft).


Sep 29 04:00 am
60 kts / 111 km/h
Gulf of St. Lawrence
Malpeque
Darnley
Indian River
New London
Summerside Arpt
Kensington
Kelvin Grove
New Annan
Central Bedeque
Kinkora
Charlottetown Arpt
Confederation Bridge
Borden
Victoria
Prince Edward Island
Sep 29 03:00 am
65 kts / 120 km/h
Northumberland Strait
Linden
Port Howe
Amherst
Pugwash
Mount Pleasant
Middleboro
Caribou Point
Oxford
Thomson Station
Tatamagouche
Jackson
Rose
Sep 29 02:00 am
70 kts / 130 km/h
Bass River
Upper Economy
Great Village
Nova Scotia
Truro
Minas Basin
Noel
Tennycape
Kennetcook
Clarksville
Gore
West Gore
Rawdon Gold Mines
Sep 29 01:00 am
75 kts / 139 km/h
East Uniacke
Beaver Bank Villa
Mount Uniacke
Halifax Intl Arpt
South Uniacke
Pockwock Lake
Hammonds Plains
St Margarets Bay
French Village
Halifax (Citadel)
Timberlea
Shearwater
East Dover
Prospect
Peggy's Cove
Lunenburg
Sep 29 midnight
85 kts / 158 km/h
Hurricane Juan
September 2003
● Tropical Storm
● Hurricane (SS1)
● Hurricane (SS2)
Times are ADT
(Atlantic Daylight Time)
Canadian Hurricane Centre
Meteorological Service of Canada
(Atlantic)

Juan is believed to be the most widely destructive tropical cyclone to hit Atlantic Canada in over a century with an estimated loss of 100 million trees in Nova Scotia and one million trees in Halifax alone. The storm claimed eight lives: four directly (two inland and two marine) and another four in the aftermath. Power outages in Nova Scotia and PEI left over 300,000 customers without power for up to two weeks. Nearly all commercial activity ceased in the Halifax area for 2–5 days and schools were closed for a week. The landmark public park, "Point Pleasant Park," had 90% of the mature growth destroyed or irreparably damaged. Dozens of marinas around Nova Scotia and PEI were destroyed and dozens of small vessels capsized or sank. Public reports of "a wall of water" moving into the coast and up Halifax harbour coincided with the arrival time of the highest surge and waves. Estimates of ***$100–150 million*** damage are conservative. The CHC issued 23 bulletins.

Noteworthy: Juan was the 4th tropical cyclone (2nd in 2003) to be flown by Canadian researchers. For more information consult the CHC website: http://www.atl.ec.gc.ca/weather/hurricane/juan/flying_e.html

Reference Sources *(A list of additional sources was compiled for Hurricane Juan)*

(CBC)	-	*Canadian Broadcasting Corporation*
(HDN)	-	*Halifax Daily News, Halifax, NS*
(TDN)	-	*Truro Daily News, Truro, NS*
(CCG)	-	*Canadian Coast Guard*
(NR)	-	*Nature's Resources (NS government magazine)*
(HOC)	-	*Halifax Outdoor Club, Halifax, NS*
(DL)	-	*Dartmouth Laker, Dartmouth, NS*
(HRM)	-	*Halifax Regional Municipality, Halifax, NS*
(TR)	-	*The Rucksack, Halifax, NS*
(CNR)	-	*Canadian National Railway*
(NSCC)	-	*Nova Scotia Community College, Halifax, NS*
(MSVU)	-	*Mount Saint Vincent University, Halifax, NS*
(DAL)	-	*Dalhousie University, Halifax, NS*
(SMUT)	-	*Saint Mary's University Times, Halifax, NS*
(EZ)	-	*EnviroZone*
(IBC)	-	*Insurance Bureau of Canada*
(NSPI)	-	*Nova Scotia Power Incorporated, Halifax, NS*
(NSEMO)	-	*Nova Scotia Emergency Measures Organization, Halifax, NS*
(LHD)	-	*Lighthouse Digest*
(TEN)	-	*The Evening News, New Glasgow, NS*
(CYCN)	-	*Charlottetown Yacht Club Newsletter, Charlottetown, PEI*
(TBE)	-	*The Bulletin Enterprise*
(GPEI)	-	*Government of Prince Edward Island*
(ADNSPEI)	-	*Anglican Diocese of Nova Scotia and Prince Edward Island, Halifax, NS*
(CFIA)	-	*Canadian Food Inspection Agency*
(DFNS)	-	*Dairy Farmers of Nova Scotia*
(COAST)	-	*Coast Magazine, Halifax, NS*
(TB)	-	*Truro Bureau, Truro, NS*

Information that is categorized by date is the summary information gleaned from newspapers published on that date.

NOVA SCOTIA—HALIFAX REGIONAL MUNICIPALITY

September 29, 2003

- A paramedic was killed when a tree fell onto an ambulance near Camp Hill Hospital at the corner of Veterans Memorial Lane and Summer Street (HH)
- Both the A. Murray Mackay and Angus L. Macdonald Bridges were closed and Metro Transit buses stopped running at 11:00 pm ADT September 28, 2003 (HH)
- Halifax Regional Municipality Mayor Peter Kelly declared a state of emergency at 9:25 pm ADT September 28, 2003 (HH)
- The ceiling of an apartment building at 251 Windmill Road, Dartmouth collapsed. The apartment building at 249 Windmill Road was evacuated as a precaution (HH)
- Several Metro Transit buses were stranded on streets and unable to return to the garage in Burnside (HH)
- A police cruiser was hit by a fallen tree (HH)
- Ferry terminals were damaged on both Halifax and Dartmouth sides of the harbour (HH)
- A firefighter was injured after a tree branch fell on him (HH)
- Areas of Halifax and Bedford were flooded due to storm surge and high tides (HH)
- A bridge at the end of Golf Links Road was being washed over by waves at 10:00 pm ADT September 28, 2003 (HH)
- Waves were being reported to have been crashing over the Bedford seawall near China Town (HH)
- All arrivals and departures from Halifax International Airport were cancelled by the afternoon of September 28, 2003 (HH)
- Homes in coastal regions were evacuated from Sambro to Clam Harbour (HH)

September 30, 2003

- 300,000 Nova Scotia Power customers were without power (HH)
- A building on 106 Pinecrest Drive, Nova Scotia Community College Akerley Campus on Woodlawn Road and Old Mill Restaurant & Lounge on Wyse Road had their roofs torn off (HH)
- Residents that were relocated during the storm were brought to the Dartmouth Sportsplex (HH)
- A spokesman for schools in the Halifax region said that at least 6–8 schools had damage. Some had roofs torn off while others had flood damage (HH)
- The A. Murray MacKay Bridge was reopened at 3:00 am ADT September 29, 2003 (HH)
- The Angus L. MacDonald Bridge remained closed all throughout the night and through Monday as the wind damaged the toll booths (HH)
- Halifax International Airport reopened at 7:00 am ADT September 29, 2003 (HH)
- The September 29, 2003 session of the sitting of the legislature was cancelled (HH)

- The Professional Center at the corner of Robie Street and Spring Garden Road had windows broken from the 10^{th}, 11^{th} and 12^{th} floors (HH)
- The Royal Nova Scotia Yacht Squadron helped keep most boats in place but those boats that were moored in the Arm either broke free or dragged their anchors (HH)
- Three yachts were ashore on Horseshoe Island and one yacht was forced over the retaining wall at Dingle Park (HH)
- At 3:30 pm ADT September 29, 2003 approximately 183,000 Nova Scotia Power customers were still without power (HH)
- Aliant reported that some cell phone towers lost power during the storm, but service was still available (HH)
- 600 tenants from the Dalhousie University residence, Fenwick Place were evacuated during the storm. Numerous windows were broken during the storm. The base of the residence was also flooded. During the evacuation, one student fell on the stairs and broke her leg (HH)
- Halifax Regional Municipality closed it 600 parks so that an assessment of the damage could be made (HH)
- Inside Point Pleasant Park – the beach boardwalk was washed away, the fire pits were washed away and large boulders were scattered throughout (HH)
- Flynn Park near Quinpool Road had approximately 2–3 dozen trees down (HH)
- A section of a Highway near Eastern Passage was damaged (HH)
- The schooner *Larinda* sank in Halifax harbour as it was struck by the *HMCS Sackville* which had broken its mooring (HH)
- Il Mercato restaurant lost a vast amount of inventory (HH)
- Murphy's on the Water sustained extensive damage when the ship *Silva* lost its mooring and hit the wharf. The *Mar II* and the *Haligonian III* which were moved to Eastern Passage prior to the storm were also damaged. The *Mar II* went ashore onto a breakwater and the *Haligonian III* took on an enormous amount of water (HH)
- Salty's and Harbourside restaurants were damaged (HH)
- The walkway beside Salty's was badly damaged (HH)
- Many road signs throughout Halifax Regional Municipality were damaged (HH)
- Along the 2.5 km (1.5 mi) boardwalk on the Halifax waterfront wharfs were damaged and the shore was eroded (HH)
- The walkway behind the Casino Hotel was torn away and left floating in the harbour (HH)
- Several railings on Navy ships were damaged (HH)
- Beach rocks were littered near the Bishop's Landing condominiums and the condominiums courtyard was damaged (HH)
- There was some flooding at Scotian, the military reserve's unit near the Casino (HH)
- The roof of the Queen Elizabeth II Health Sciences Center was damaged. More than 200 patients had to be moved (HH)

- The roof of a three story apartment building at 7 Forbes Street was torn off and landed on the street. The roof flattened a car that was parked nearby and sheared open a side to a neighbours house (HH)
- The 22 apartment complex at 4 Mandaville Crescent in Fairview had its roof blown away and a tree was on top of the building. The roof flew off and covered two parked vehicles (HH)
- There was damage to the apartment building at 12 Mandaville Crescent (HH)
- A family's two storey building on Ketch Harbour Road was shifted into the water and the wharf was destroyed. 215 lobster traps were lost with an estimated value of *$30,000* (HH)
- At the Dock and Dory Marina one fishing vessel had sunk while the vessel *Sea Cat* and a wharf were driven onto the shore (HH)
- St. James United Church was severely damaged. Siding was torn off the sides, the brick chimney collapsed and the picket fence surrounding the structure was also damaged (HH)
- A house on Atlantic View Drive in Sambro Head lost a 7.5–15.0 m (25–49 ft) portion of its roof. Several other houses on the street lost siding and shingles. Telephone service in this area was also unavailable (HH)
- The roof of the Tallahassee Community School was torn away, flooding parts of the school (HH)
- The seawall at Silver Sands was completely demolished (HH)
- In Eastern Passage, Shore Road residences were evacuated due to the high waves (HH)
- Two hangers at Shearwater Airport were damaged and a nearby hanger at the Canadian Coast Guard was also damaged. None of the aircrafts were damaged (HH)
- Coast Guards ships and aircraft did not sustain damaged, however docks in Dartmouth sustained minor damage (HH)
- The schooner *Emirl* which was anchored at the Armdale Yacht Club was hit by another yacht which had lost it moorings. The *Emirl* broke free and went aground at the end of Northwest Arm (HH)
- Armdale Yacht Club lost about 20 boats (HDN)
- Dartmouth Yacht Club was littered with boats (HDN)
- The Bedford Basin Yacht Club reported that at least 11 yachts were driven ashore (HDN)
- At the Marina on Alderney Drive, Dartmouth three boats were driven ashore and the docks sustained major damage (HDN)
- In Herring Cove, wharfs, sheds, boat houses, and boats were damaged and floating in the water. At least 12 boats were jammed under the highway bridge near the end of the cove (HDN)
- A 160 year old heritage house in Ketch Harbour was severely damaged when a large tree fell into the roof (HDN)

- Momoya Sushi Restaurant on Barrington Street, Halifax was severely damaged. The roof and store sign were damaged and the front window was blown out (HDN)
- The Roy Building on Barrington Street had pieces of its roof torn off and other buildings had pieces of board ripped away (HDN)
- At 1801 Hollis Street the Joseph Howe building had two large panels smashed out from its top floors (HDN)
- Dartmouth – 10 train cars derailed from their tracks. Two of these cars were filled with clay and another empty propane car was washed into Halifax harbour (HH)
- Rains and storm surge washed out 1,300 m (0.8 mi) of CN tracks to the oil facilities in Dartmouth (HH)
- VIA Rail's passenger service from Halifax to Moncton was cancelled (HH)
- The train station in the south end of Halifax was flooded and without power (HH)
- Several cargo containers were blown over (HH)
- Some of the cranes in Halifax's south end train terminal were shifted (HH)
- Buoys and other navigational aids around Halifax harbour were affected by the storm (HH)
- Two cargo vessels in Halifax harbour, *Oldendorf* and *Saudi* were damaged slightly in the storm after they broke their moorings (HH)
- Halifax International Airport and NAVCanada reported that some flight aid equipment was out of service as a result of the storm (HH)

October 1, 2003

- A mother and her two children were killed when their house burnt down as a result of a candle fire at approximately 12:50 am ADT September 30, 2003. Their house was located at 3994 Micmac Street (HH)
- Two other fires were a result of candles. One of these fires caused only minor damage, however the second at 2232 Quinn Street damaged an apartment extensively (HH)
- Dalhousie University, Mount Saint Vincent University, Saint Mary's University and Kings College were shut down until the October 6, 2003 (HH)
- Surgeries at the Queen Elizabeth II and Dartmouth General Hospital were cancelled (HH)
- It was estimated that 25 fish sheds at approximately *$20,000* each were damaged or destroyed in the Eastern Shore and Three Fathom Harbour area (HH)
- In Indian Harbour all private wharfs were blown away from there original locations (HH)
- Several golf courses in Halifax Regional Municipality obtained serious damage:
    - Glen Arbour Golf Course reported they lost 500–1,000 trees
    - Ashburn's Old Course reported they lost hundreds to thousands of trees (HH)
    - The Brightwood Golf Course in Dartmouth lost most of the poles and netting used to protect neighbouring homes (HH)

- The Halifax Forum and Civic Arena in Halifax, Bowles Arena and Grey Arena in Dartmouth, Dartmouth Sportsplex, LeBrun Center in Bedford, Colchester Legion Stadium in Truro and Cole Harbour Place had there ice surfaces melt (HH)
- The Halifax Forum also had roof damage which caused several leaks (HH)
- Two scoreboards at the Mainland Common recreational facilities suffered damage. Some light poles also slightly turned (HH)
- The docking system at the St. Mary's boat club was destroyed and several of their recreation centers lost siding and windows (HH)
- EastLink's cable, high-speed internet and telephone services were unavailable for 60% if their customers two days after the storm. The system was never down but was affected by the storm power outages (HH)
- Secunda Marine Services on Canal Street, Dartmouth sustained damage to its offices. The roof was damaged and three floors were ruined (HH)

October 2, 2003

- In Prospect, all private wharfs were destroyed and only the government wharf remained (HH)
- Three boats in Prospect were destroyed and two others were still missing (HH)
- Several sheds were also damaged in Prospect (HH)
- Peggy's Cove experienced damage to a couple of wharfs (HH)
- Aliant reported that approximately 7,000 customers reported service interruptions during the storm (HH)
- Both Fairview and Camp Hill Cemeteries were damaged (HH)
- Sackville High School had its gymnasium roof torn off and fold back onto the main structure of the school. The gymnasium floor was ruined (HH)
- L.C. Skerry School in Waverley had a tree fall through its roof (HH)
- Bel Ayr School in Dartmouth had a tree fall onto the roof of its gymnasium and washrooms (HH)
- Harbourview Acres at 7 Jamieson Street, Dartmouth obtained damage to 60 condominiums when a section of the roof was ripped away (HH)
- More than 12 tombstones were damaged and eight large trees fell in St. Paul's Cemetery on the corner of Barrington Street and Spring Garden Road (HDN)
- The monument of Augnes Back inside St. Paul's Cemetery was destroyed (HDN)
- The Green Lantern Building on Barrington Street was damaged. A portion of the roof was torn away letting rain pour inside the building. Treka Designs Hair Salon moved its business to 2120 Maynard Street until repairs could be made (COAST)
- Pogue Fado pub sustained damage to its sign outside and tile damage to the ceiling (COAST)
- The Shoe Shop restaurant roof was also damaged and a window was blown in (COAST)
- At Centennial building on Hollis Street over 60 windows needed to be replaced (COAST)

- The four Nova Scotia Community College campuses, Akerley, Institute of Technology, Halifax, and Truro, were closed until October 6, 2003 due to power loss (NSCC)

October 3, 2003

- The Scotia Square branch of St. Joseph's Early Childhood Centre's obtained approximately *$90,000* in damages as the storm destroyed the roof of its playground and broke out windows. Trees also damaged the centre at Brunswick Street (HH)
- A large section of the roof of Halifax Grammar School was torn away and heavy rains caused water damage inside (HH)
- Due to power outages, a residential fire in Spryfield and another in Eastern Passage were attributed to burning candles (HRM)

October 4, 2003

- A new home that was under construction was severely damaged on Cutter Drive (HH)
- The roof of the Centennial and Victoria buildings at the Queen Elizabeth II Hospital were damaged and needed to be replaced. The Nova Scotia Hospital had its roof and windows damaged as well (HH)
- Damage to the Halifax Infirmary siding and Dartmouth General Hospitals were also reported (HH)
- Saint Mary's University Rice Residence obtained water damage to 55 apartments during the storm. It had to evacuate approximately 200 students (HH)
- 10–14 live explosives were swept ashore in Bedford basin during the storm. The Navy's disposal team detonated these explosives during the following week (HH)
- Near Lawrencetown at the Fishermen's Reserve a shed and other buildings were damaged and floated into the sea. Fishing boats were damaged and fishing gear was scattered throughout the area (HDN)
- Petpeswick Harbour – a federal government wharf which was handed over to a local society was destroyed. 11 fishing boats were stranded and had nowhere to dock (HDN)

October 5, 2003

- A man was injured when he fell from a ladder while clearing branches from a tree (HH)

October 7, 2003

- Otis elevators had to repair 40 elevators in 18 buildings in Halifax Regional Municipality after the storm. Some elevators with roof top equipment sustained wind damage and others with basement equipment experienced flood damage (HDN)
- The Eastern Passage boardwalk were severely damaged (HDN)
- European Pantry on Elm Street in Halifax was without power for over a week and had lost about *$25,000* in spoiled foods (HH)

- Musqie Valley Farms in Middle Musquodoboit lost both their dairy and beef farms at an estimated cost of *$300,000* for repairs (HH)

October 8, 2003

- Acadia School on Sackville Drive was damaged. The school is used for Halifax Regional Municipality offices and the Sackville Library. The chimney of the building was destroyed and the sprinkler system was turned on causing damage to the front of the building (HDN)
- The Admiral DeWolfe Park on the waterfront in Bedford had heavy damage to the walkways and retaining wall (HDN)

October 15, 2003

- 16 operating rooms were damage throughout metro's hospitals (HDN)
- At the Victoria General Hospital Centennial Building two operating suites were damaged and seven floors of the hospital were damaged (HDN)
- At the Sackville Library, the program room, circulation area and foyer were flooded, however no books were damaged. A temporary library was opened at 636 Sackville Drive (HDN)
- The Anglican Diocese of Nova Scotia and Prince Edward Island Resource Centre Library in Halifax sustained water damage and repairs were needed (ADNSPEI)

October 19, 2003

- A man passed away from a heart attack near Upper Prospect. The man was helping out on a government wharf with lobster traps that were arriving from communities which donated the traps to those who had theirs destroyed (HDN)

October 22, 2003

- Three homes in Upper Sackville had their basements flooded with sewage when the power was restored to the area (HDN)
- In Point Pleasant Park, an average of five trees were falling per second based on the three hour storm (HDN)
- In Public Gardens, 40 trees were knocked down and throughout Halifax Regional Municipality 600 streets had fallen trees (HDN)
- 40,000 – 50,000 trees total fell on Halifax Regional Municipality property (HDN)
- The damage incurred by Dalhousie University's $0.3\ \text{km}^2$ (79 acre) property was ***$1.8 million*** which included 47 trees and various buildings (DAL)

October 23, 2003

- The Salt Marsh Trail in Cole Harbour sustained *$500,000* in damages and may never be fully restored (DL)

October 30, 2003

- Nova Scotia Power's transmission and distribution system suffered the most damage and the largest outage in Nova Scotia Power's history (NSPI)
- A list of the damages was compiled by Nova Scotia Power:

  - Three of five high capacity transmission lines were knocked out
  - Three (37 m) 120 ft high transmission towers crumpled
  - 17 main transmission lines were damaged or knocked out of service
  - 45 major substations were affected
  - 145 distribution feeders were damaged or tripped off, including 106 in Halifax Regional Municipality
  - Much of the 4,500 km (2,800 mi) distribution lines in Halifax Regional Municipality were damaged
  - Power crews replaced 275 transformers, 760 power poles, and 125 km (78 mi) of conductor wire (NSPI)
- By noon on the second day 50% of the 300,000 customers had their power restored; within five days 95% were restored (NSPI)
- Power meters and masts were ripped off thousands of homes and businesses in Halifax Regional Municipality (NSPI)
- Halifax–Part of the roof was ripped off at Nova Scotia Power's call centre in Barrington Tower and this led to flooding and breaking of dozens of windows (NSPI)
- Rain poured into Barrington Tower from the roof and caused a fire which resulted in the evacuation of the building (NSPI)

November 2003

- On Saint Mary's University campus, the Rice Residence and the McNally Building both had damage to their roofs (SMUT)
- The Student Centre and the Burke Building on Saint Mary's campus were flooded and trees were uprooted (SMUT)
- The Nova Scotia Red Cross mobilized 200 volunteers to assist approximately 30,000 people with 5,000 meals, 40,000 bottles of juice and water, and conducted 70 food drops in 45 different locations between Halifax Regional Municipality and Truro (NSEMO)

November 5, 2003

- The hardest hit woodlot areas were near Musquodoboit Harbour and within a 30 km (18 mi) radius of Truro (HH)
- The trees most affected by the storm were mature fir and spruce (HH)

November 8, 2003

- Emera Inc. issued a report that Hurricane Juan cost them *$12.6 million*. The cost to the utility was *$4 million* in one time operating costs (revenue and labour) and *$8.6 million* in capital costs (HDN)
- The last hook up of power was made on October 12, 2003 (HDN)
- A 15 unit apartment building at 7 Forbes Street in Spryfield was determined to be unsafe 5 weeks after Hurricane Juan and tenants were forced to leave. Water was leaking into the complex and it was a possibility that the water may enter the electrical system (HDN)

November 10, 2003

- West Chezzetcook – the Blueberry Run Trail had an estimated ***\$10,000*** worth of damage (HOC)

November 19, 2003

- Damage costs in the Halifax Regional Municipality were expected to exceed ***\$30 million***. ***\$16.7 million*** will be used to restore parks and almost ***\$6 million*** will be needed for road and sidewalk repairs (HDN)

December 2003

- McNabs and Lawlor Islands Provincial Park revealed the greatest amount of damaged 1.5 km^2 (370 acres) of all the provincial parks (NSDNR)
- 35% of the forested land on McNabs and Lawlor Islands had some kind of tree damage (NSDNR)
- The cleanup on the islands was expected to be completed by March 2005 (NSDNR)
- McNabs Island–approximately 100 trees fell on power lines and power was finally restored to the main line on November 15, 2003 (TR)
- The road to the lighthouse on McNabs Island was breached so severely the lighthouse is cut off from the rest of the island during high tide (HDN)
- The main wharf on the island buckled and the sections of the deck were washed away (TR)
- The freshwater pond located near Fort McNab National Historic Site was opened to the sea when the southern shore was carved out by a 9 m (29 ft) wide and 3 m (10 ft) deep channel creating a tidal inlet to the Halifax harbour (HDN)
- The freshwater wildlife and aquaculture at McNabs Pond was lost when the saltwater flowed into the ecosystem (TR)

December 5, 2003

- Mount Saint Vincent University lost 223 trees and total damage to the campus was ***\$500,000*** (MSVU)
- Mount Saint Vincent University also suffered minor building damage (MSVU)

January 2004

- The Sambro Island lighthouse, North America's oldest lighthouse, sustained damage to the base of the tower and to the gas house from the storm surge (LHD)
- The little wooden Terence Bay lighthouse located a few miles west of the Sambro Island lighthouse, lost shingles on its seaward side (LHD)

January 3, 2004

- In Three Fathom Harbour, 16 wharfs were destroyed and only four were left intact after the storm. The breakwater was washed out in places and the beach was littered with pieces of lumber (HH)

January 14, 2004

- Porters Lake Provincial Park damages were estimated to be near *\$100,000* (HH)

January 27, 2004

- A warehouse for a lighting business in Dartmouth was damaged. A large portion of the roof was torn away. Since then, tarps have not kept water out and mould was growing inside some walls. The initial estimate of repairs were *\$15,000* due to the roof, but because of the mould it has increased to *\$96,000* (HH)

February 2004

- Point Pleasant Park (PPP) was the hardest hit out of Halifax Regional Municipality's 1,200 parks (HRM)
- An estimated 70% or more than 55,000 trees in PPP 525,000 m^2 (130 acres) were downed or damaged by the storm (HRM)
- The cleanup at PPP took months and the scheduled re-opening was to be June 2004 (HRM)
- The loss of most of the forest canopy dramatically changed the look of PPP (HRM)

March 2, 2004

- The contract for repairs of Porters Lake Provincial Park was valued at *\$46,750*. In a statement released January 14, 2004 the total damage was estimated at *\$100,000* (NSDNR)
- A labour contract for *\$4,000* was awarded to Dollar Lake Park for damage cleanup (NSDNR)
- All of the beaches in Halifax Regional Municipality were heavily damaged from wind damage (NSDNR)

April 29, 2004

- The cost to re-open PPP was projected at *\$2.2 million* (HH)

May 20, 2004

- Halifax – it will cost *\$2 million* to replace 4,000 street side trees lost from the hurricane (HH)

NOVA SCOTIA

September 30, 2003

- A man from Newport, Hants County was killed when a tree was uprooted and fell onto his vehicle on Highway 14 at approximately 1:00 am ADT September 29, 2003 (HH)
- New Brunswick power crews were called for assistance (HH)

- In Schubenacadie, silos and cow barns were damaged and flying debris broke out windows of two vehicles and a tractor. Several other structures in the area were also damaged (G)
- Bridgewater, Mahone Bay, Lunenburg and Chester all lost power (HH)
- In Shubenacadie a barn collapsed trapping 25 dairy cows inside. Eight cows died from the initial collapse but the barn owner suspected that more would probably die due to injuries (HH)
- In Brule Point, Colchester County a barn partially collapsed and trapped two horses (HH)
- Waves washed over Caladh Avenue in Pictou (HH)
- The main road leading to Green Bay was washed out making it impossible to travel to or from Green Bay (HH)
- The road from the back of Crescent Beach to LaHave Islands was closed as debris was littered throughout (HH)
- A barn collapsed at a beef farm in Hardwood Lands, Hants County (HH)
- Federal, Provincial and Municipal governments asked all non-essential workers to stay at home (HH)
- Northern Nova Scotia was not severely damaged (HH)
- Trees were uprooted in Truro (HH)
- Pictou–the ship *Hector* broke its moorings and crashed into the water taxi *Charlotte Darlene* before resting ashore on the rocks. Overall damage to the ship was minimal (HH)
- Inside the Hector Marina, one sail boat sank while three other ships went ashore. The storm also damaged several piers and the wharf (HH)
- A lady and her pet dog escaped a house fire near Hants East Rural High School on Highway 2. High winds due the hurricane fed the fire, but the cause was unknown (HH)
- Schools in Halifax and Colchester-East Hants were closed. In Pictou, some schools were closed but most of them were expected to be open (HH)

October 2003

- Milk movement and processing in the province was only disrupted for one day and no loss was reported to milk companies (DFNS)
- Four dairy farms suffered major damage in the central part of the province and applied for catastrophe assistance (DFNS)

October 1, 2003

- Point Road in Blue Rocks in Lunenburg County was completely destroyed (TBE)
- The HMS Bounty made an unscheduled stop in Lunenburg to avoid the storm (TBE)

October 2, 2003

- In Truro, Victoria Park sustained damage to more than 1,000 trees (HH)

October 3, 2003

- An indoor horse riding arena was destroyed in Greenfield, Queens County (TDN)

October 9, 2003

- Following the onset of Hurricane Juan, a vast number of normally unseen birds begin to turn up on Nova Scotia shorelines (EZ)

October 30, 2003

- In Stewiacke, Truro, Tatamagouche, and Pictou County, many farmers had their barns and silos flattened or damaged (NSPI)

November 4, 2003

- Forestry operations in the centre of the province were greatly affected by 'wind bombs' that completely flattened section of forest on various woodlots (NSDNR)

December 2003

- Flattened sections of forest due to winds occurred in a 35 km (22 mi) swathe east of the storms eye (NSDNR)

January 3, 2004

- Dalhousie Mountain Maple Products in Pictou County had 10% of it trees and sap lines damaged. It was estimated that the cost of damages were $6,000 (TEN)

January 23, 2004

- 1,424 requests for financial relief were sent to the government (HH)

March 2004

- The 23.7 m (77 ft) lighthouse at Little Hope Island near Port Mouton was demolished on December 7, 2003. Hurricane Juan caused major damage to the concrete floor and caused the lighthouse to lean. A northeaster in early December caused more damage to the lighthouse leading to its collapse (LHD)

Spring 2004

- Debris cleanup continues at the Provincial Wildlife Park in Schubenacadie and damage was done to the various animal pens and fences (NR)

April 28, 2004

- Due to the warm waters late in the fall, lobster shells were soft. In the spring of 2004, however, the shells were hard because of how rapidly the sea temperatures cooled for the winter and how the lobster moults (HH)

April 30, 2004

- 'Juan' was retired from the World Meteorological Organization's hurricane names list (CHC)

May 5, 2004

- A destructive swath of approximately 6,000 km^2 (1.5 million acres) of trees was damaged during the storm (HH)
- Elmsdale Lumber reported that 4 km^2 (988 acre) of their woodland was flattened (HH)

May 11, 2004

- The government of Nova Scotia reported that it paid *$900,000* in food vouchers to those people on social assistance (TDN)

NEW BRUNSWICK

September 30, 2003

- Two fishermen from Caraquet, New Brunswick were lost in stormy seas off Anticosti Island, Quebec. The captain of the ship was able to make it ashore (HDN)

PRINCE EDWARD ISLAND

September 30, 2003

- 7–10 boats at the Charlottetown Yacht Club had sunk and many others were damaged (G)
- Floating docks were ripped loose in Charlottetown (G)
- The Brackley Drive-In theatre screen, on Brackley Beach was totally destroyed during the storm (G)
- A family's trailer home in Alexandra was totally ripped apart. The home shifted several feet and all the tie downs were torn away from the trailer. The roof was blown 91–152 m (300–500 ft) away from the house (G)
- Parts of the roof at the Montague Town Hall were torn off and a barn in Orwell was destroyed (G)
- Flat River–an outbuilding was damaged and blown across a potato field (G)
- It was estimated that Charlottetown lost approximately 100 of it largest and oldest trees (G)
- The waterfront boardwalk, Victoria Park and Confederation Landing Park in Charlottetown were damaged (G)
- Connaught Square obtained significant damage (G)
- Power was lost to Cody Banks Rink, Civic Center and Simmons community rink. Workers were trying to prevent the ice from melting (G)

October 2003

- The storm destroyed the two marinas (new and old) in Charlottetown and was the worst weather related disaster to hit the club in living history (CYCN)

October 1, 2003

- More than 40,000 Maritime Electric customers were without power; all but 3,000 were restored within a 24 hour period (GPEI)
- Severe tree damage led to power outages and property damage (GPEI)

October 2, 2003

- Golf courses throughout the province sustained damage during the storm (G)
    - Belvedere Golf Course was hit hard. It lost about 25, 100 year old trees. Overall, the storm damaged a couple of hundred of trees on the course. Most greens were not damaged but the driving range was badly damaged (G)
    - Meadow Golf and Country Club was damaged (G)
    - Clyde River Golf Course had approximately 150 – 200 trees that were knocked down (G)
    - At the Belfast Highland Greens they reported approximately 400 trees had fallen during the storm (G)
    - At the Brudenell River/Dundarave course only a couple of trees were lost (G)
    - Beaver Valley Golf Course lost some trees but there was no major damage to the course (G)
    - Both the Glen Afton Golf Course and the course at Stanhope escaped without damage (G)
- Over 80 claims were received by Co-operators General Insurance Company for damages (CI)

October 3, 2003

- In Cardigan, a large portion of the roof of a local school was torn away. 1,135 litres (300 US gallons) of water had to be pumped out of the school and it was estimated that it would cost *$25,000* to repair the roof (G)

October 8, 2003

- The lighthouse at Point Prim had its paint stripped off the walls but the 158 year old structure remained standing (G)
- Throughout Point Prim older buildings were damaged and many trees were uprooted and fell to the ground (G)
- The outhouse at Point Prim lighthouse was blown into a nearby wooded area (G)
- Extensive erosion occurred on the shoreline surrounding the lighthouse at Point Prim (G)
- Potato harvest was halted for a day or two and then delivered. There was no damage to the crop (CFIA)
- The apple crop had a 60% loss in the central part of the province, 25% was lost in the eastern portion and none was lost in the western part of the province (CFIA)
- Two growers in the central part of the province lost all of their apple crops (CFIA)

October 9, 2003

- Hurricane Juan did not have a significant effect on Confederation Bridge. The bridge closed only for high sided vehicles, and no damage was reported (G)
- Maritime Electric estimated *$450,000* in damages due to Hurricane Juan (G)
- Approximately 30% of the boardwalks in Charlottetown were damaged and unsafe to use as a result of the storm (G)

December 3, 2003

- The damages in Prince Edward Island are estimated at *$14 million* (HH)

January 2004

- Four docks from the old marina in Charlottetown need to be completely rebuilt (CYCN)
- The marinas in Charlottetown are expected to be fully operational by spring 2004 (CYCN)

January 22, 2004

- The waterfront restaurant, Lobsters on the Wharf, in Charlottetown was damaged significantly during the storm (CBC)

March 19, 2004

- The Charlottetown Driving Park sustained damage to race track and cancelled the P.E.I Colt Stakes. The roof was damaged, and the grandstand is not safe to be used. Lights in the overhang were also damaged. Overall the track sustained approximately *$250,000* in damages (CBC)

July 6, 2004

- In Cooks Brook (near Middle Musquodoboit), a century-old home that had it's roof ripped off and sustained heavy water damage was finally fully restored and the residents were allowed to move back (TB)

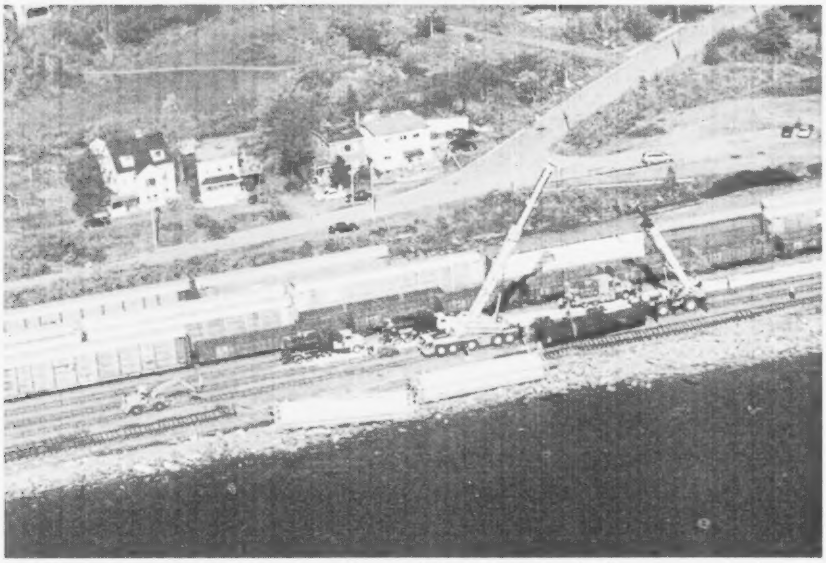
NOVA SCOTIA, NEW BRUNSWICK, PRINCE EDWARD ISLAND, NEWFOUNDLAND

April 29, 2004

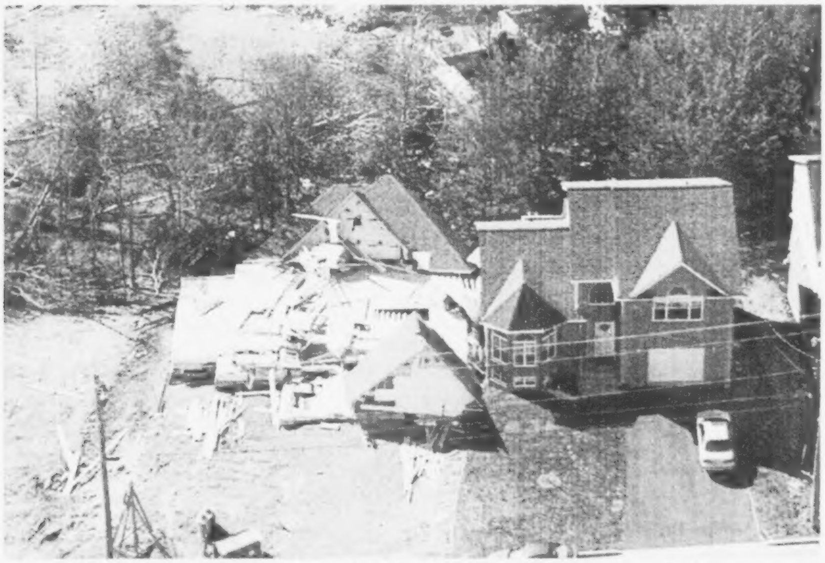
- Insurers revealed a preliminary loss of ***$113.4 million*** based on 20,972 claims as of December 31, 2003 (IBC)
- The ***$113.4 million*** loss does not include marine insurance claims which are estimated at an additional ***$20 million–$40 million*** (IBC)
- The ***$113.4 million*** can be broken down into:
    - Personal Property–***$67.6 million*** total insured loss, 17,073 claims, and *$3,959* average per claim
    - Commercial Property–***$40.2 million*** total insured loss, 2,083 claims, and *$19,315* average per claim

- Personal Automobile–*$5.3 million* total insured loss, 1,782 claims, and *$2,974* per average claim
- Commercial Automobile–*$0.3 million* total insured loss, 34 claims, and *$8,341* average per claim

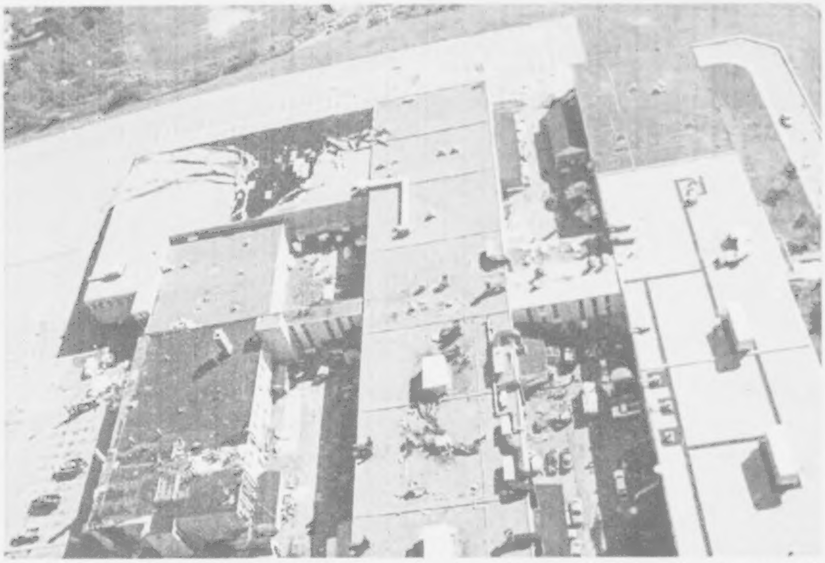
PHOTO ALBUM



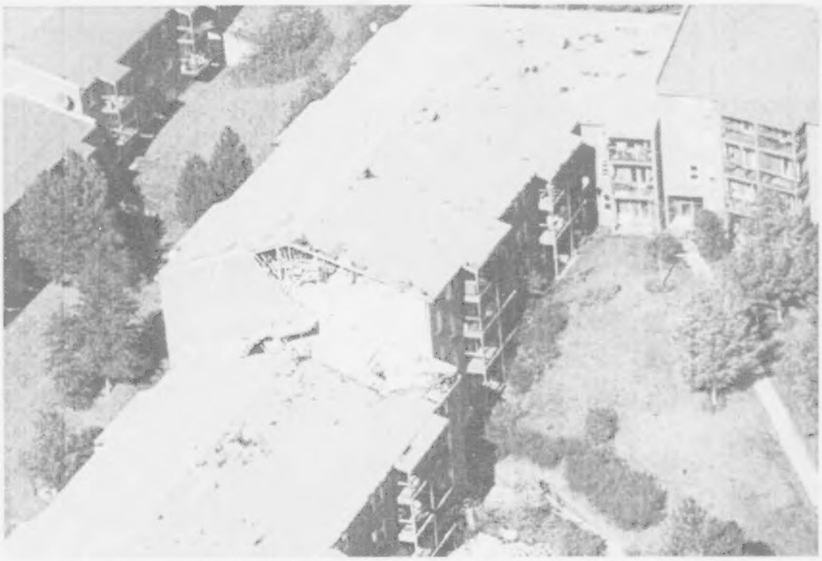
Train tracks and railcars wash into Halifax Harbour during the storm surge.
Photo: Maritime Forces Atlantic



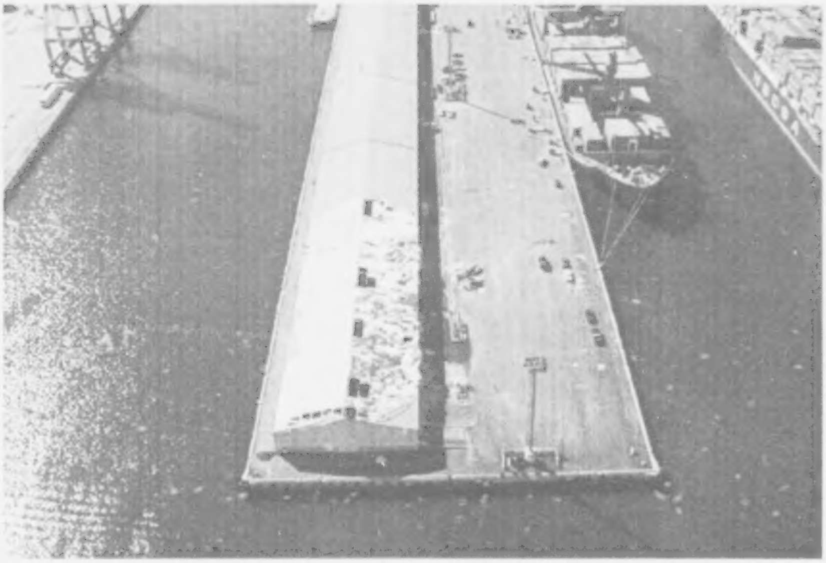
House under construction destroyed by hurricane winds.
Photo: Maritime Forces Atlantic



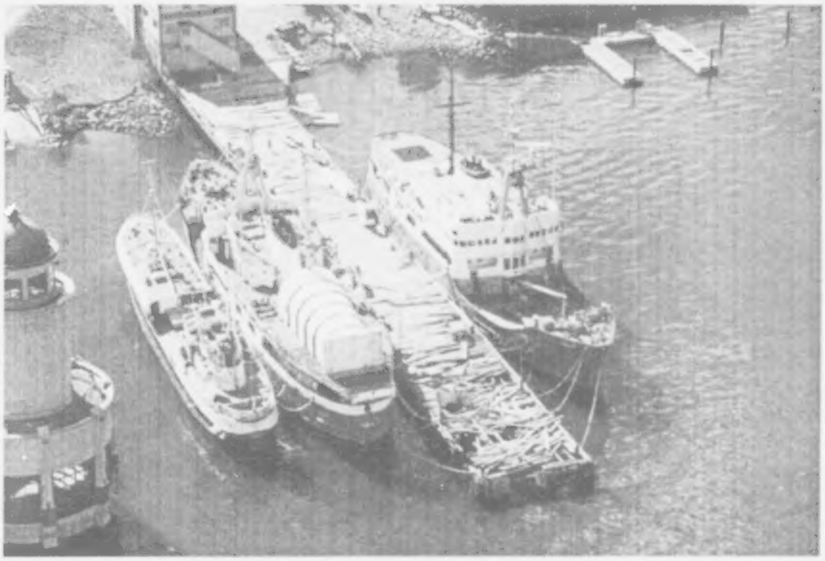
Wind damage to the hockey arena roof at the Akerley Campus in Dartmouth.
Photo: Maritime Forces Atlantic



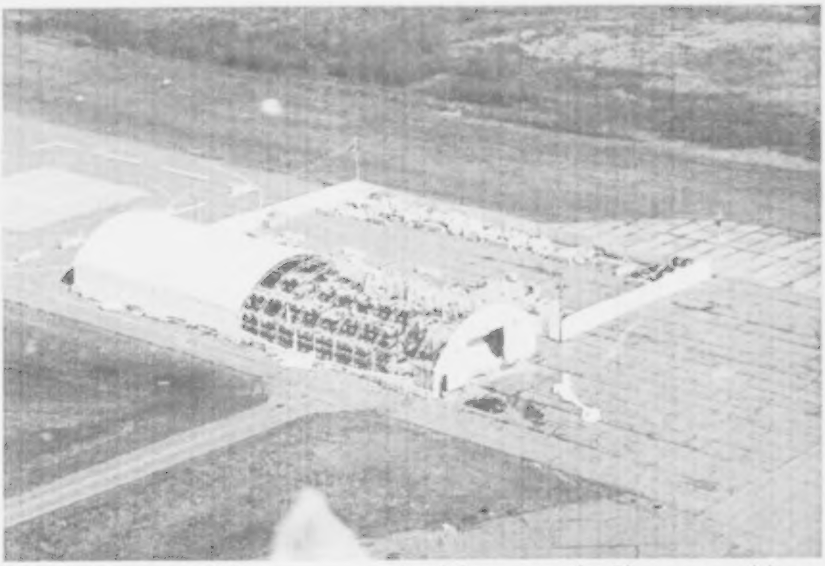
Apartment building in Dartmouth suffers extensive damage.
Photo: Maritime Forces Atlantic



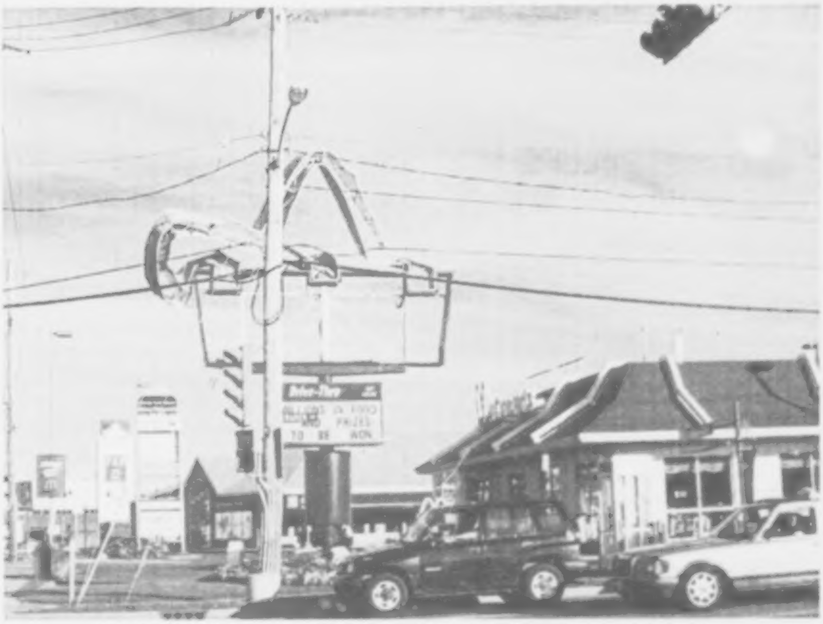
Halterm container pier in Halifax.
Photo: Maritime Forces Atlantic



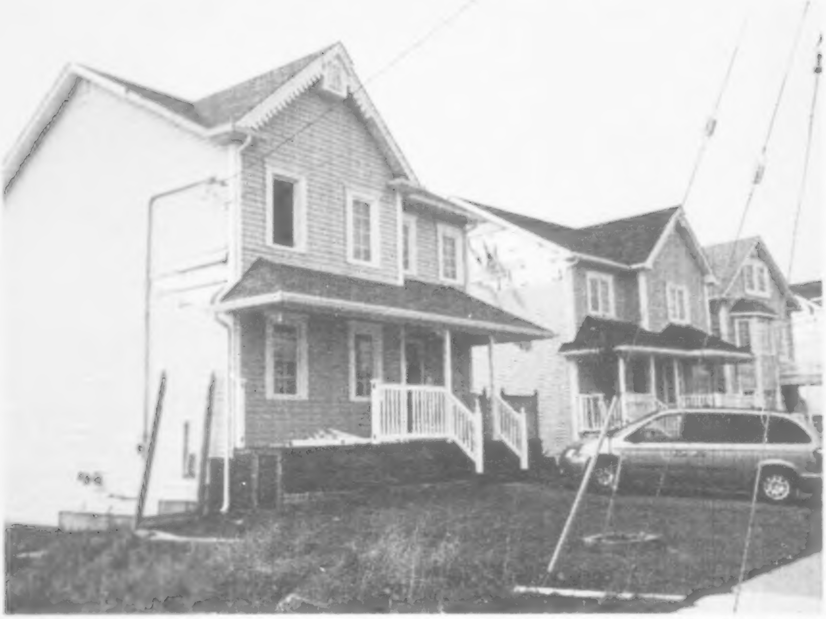
Storm surge causes wharf damage in Halifax Harbour.
Photo: Maritime Forces Atlantic.



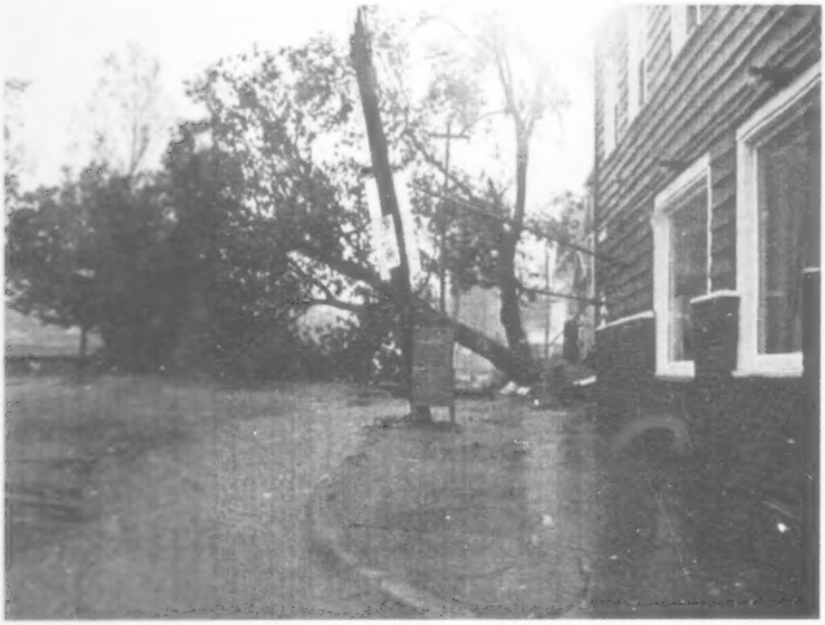
One of the many buildings that sustained damage at the Shearwater airbase.
Photo: Maritime Forces Atlantic



McDonald's sign in Dartmouth twisted by the wind gusts.
Photo: Chris Fogarty



Blown out window, siding damage, and broken sundeck to a house in Cole Harbour.
Photo: Ian Hickey



A fallen tree and heavy rain following Hurricane Juan made
Prince Albert Road in Dartmouth very dangerous.
Photo: Jaclyn Poole

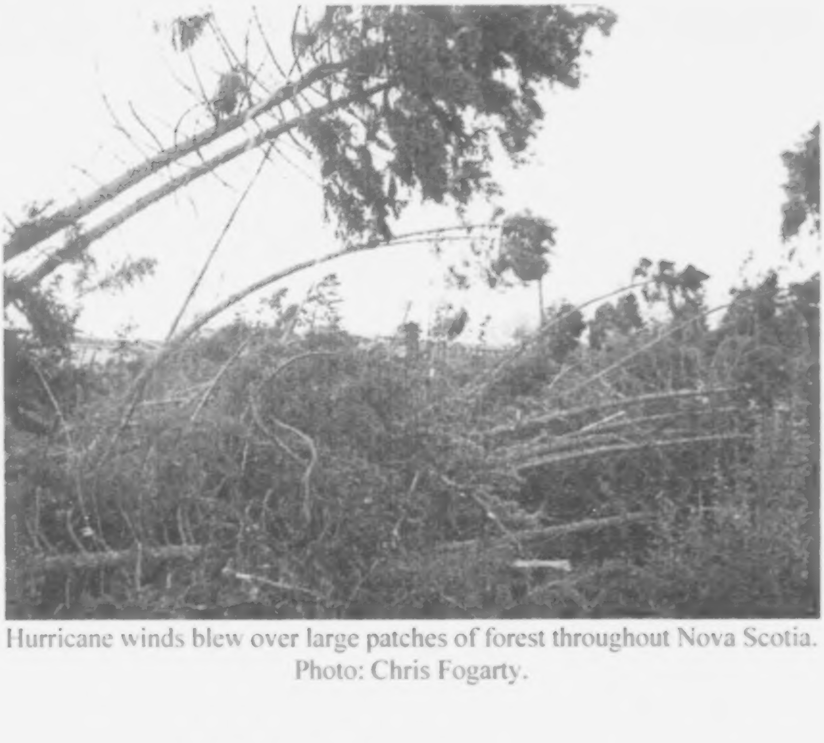
Fallen trees caused extensive vehicle damage.
Photo: Chris Fogarty

Vinyl sliding was shredded off these houses in Cole Harbour.
Photo: Ian Hickey

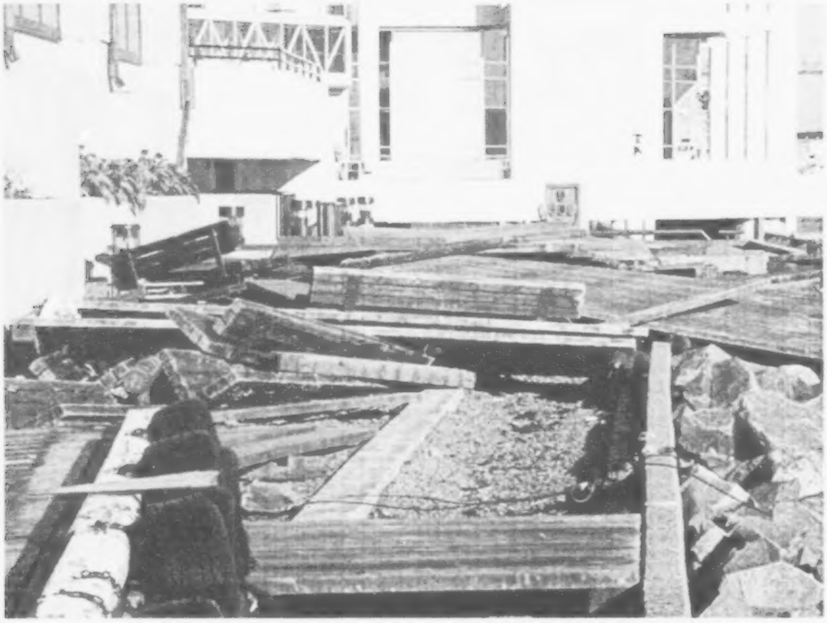
Thousands of trees in Point Pleasant Park in Halifax blown over.
Photo Credit: Jim Abraham and Chris Fogarty

Saint Johns Anglican Church, Oyster Pond NS.
Photo: Jim Abraham and Chris Fogarty

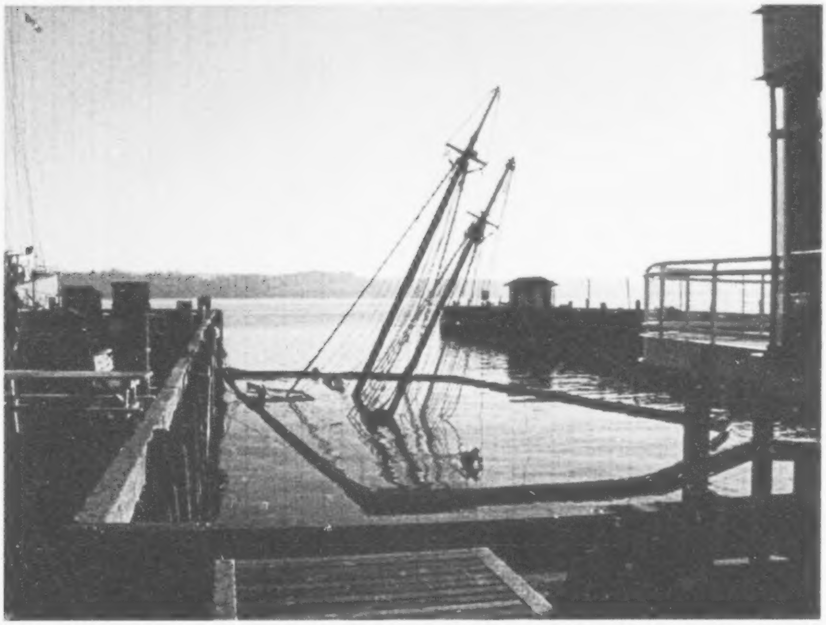
Roof blown off house in Chebucto Head.
Photo Credit: Jim Abraham and Chris Fogarty



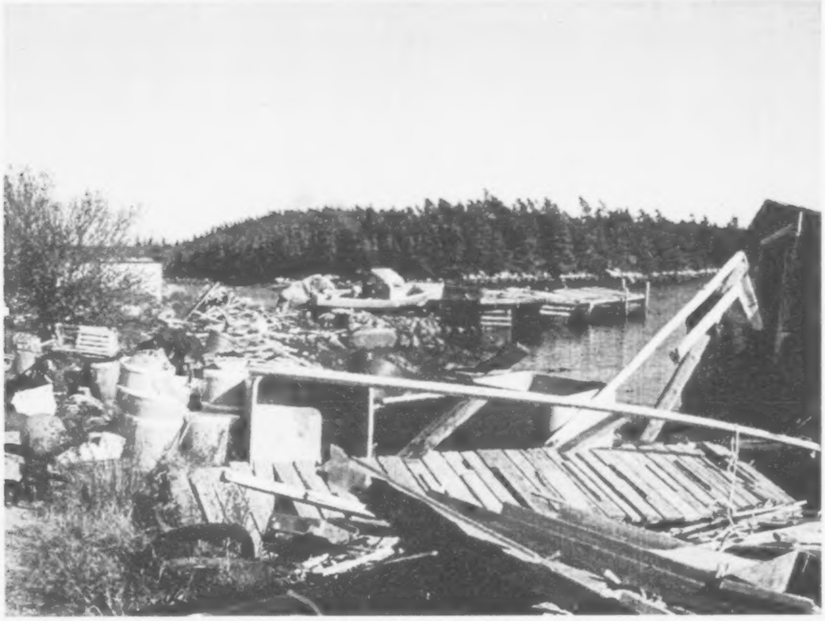
Hurricane winds blew over large patches of forest throughout Nova Scotia.
Photo: Chris Fogarty.



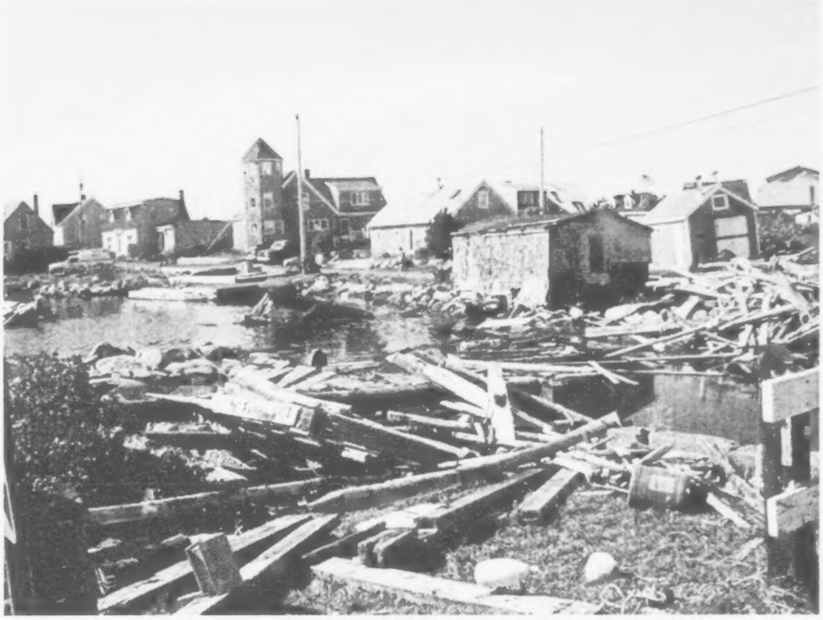
Boardwalk damage caused by the storm surge in Halifax Harbour.
Photo: Doug Mercer



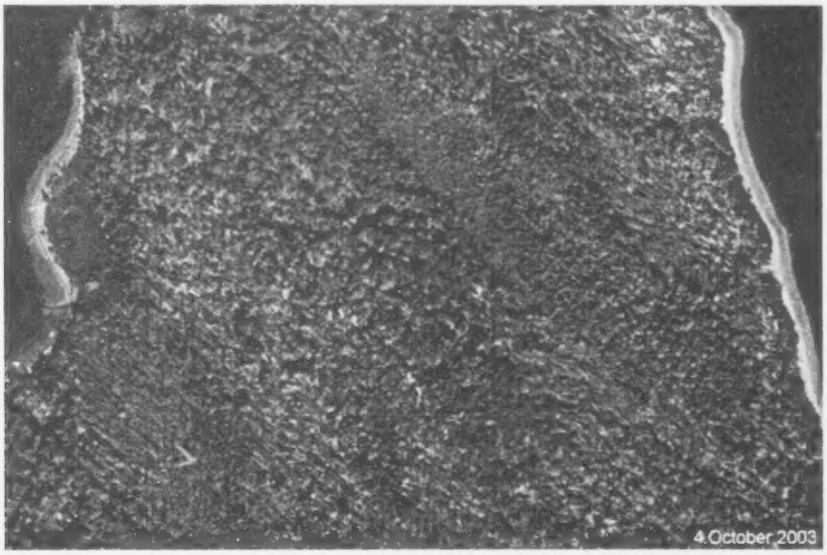
This sailboat tied to a wharf in Halifax sunk after another boat crashed into it.
Photo: Doug Mercer



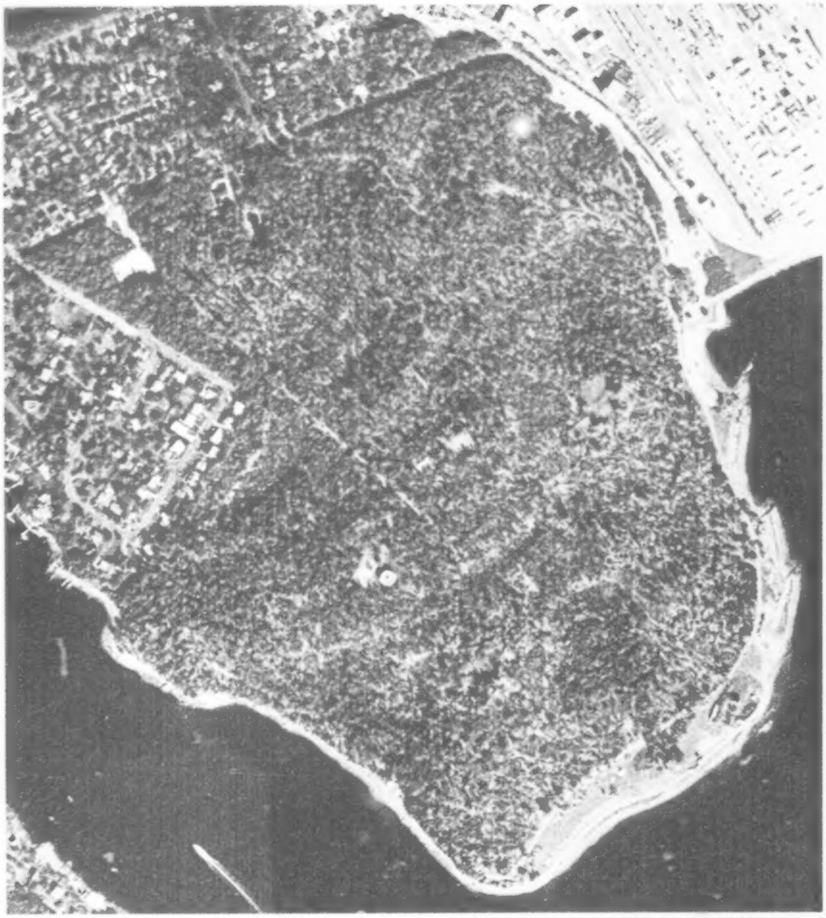
Sambro, Nova Scotia.
Photo: Doug Mercer



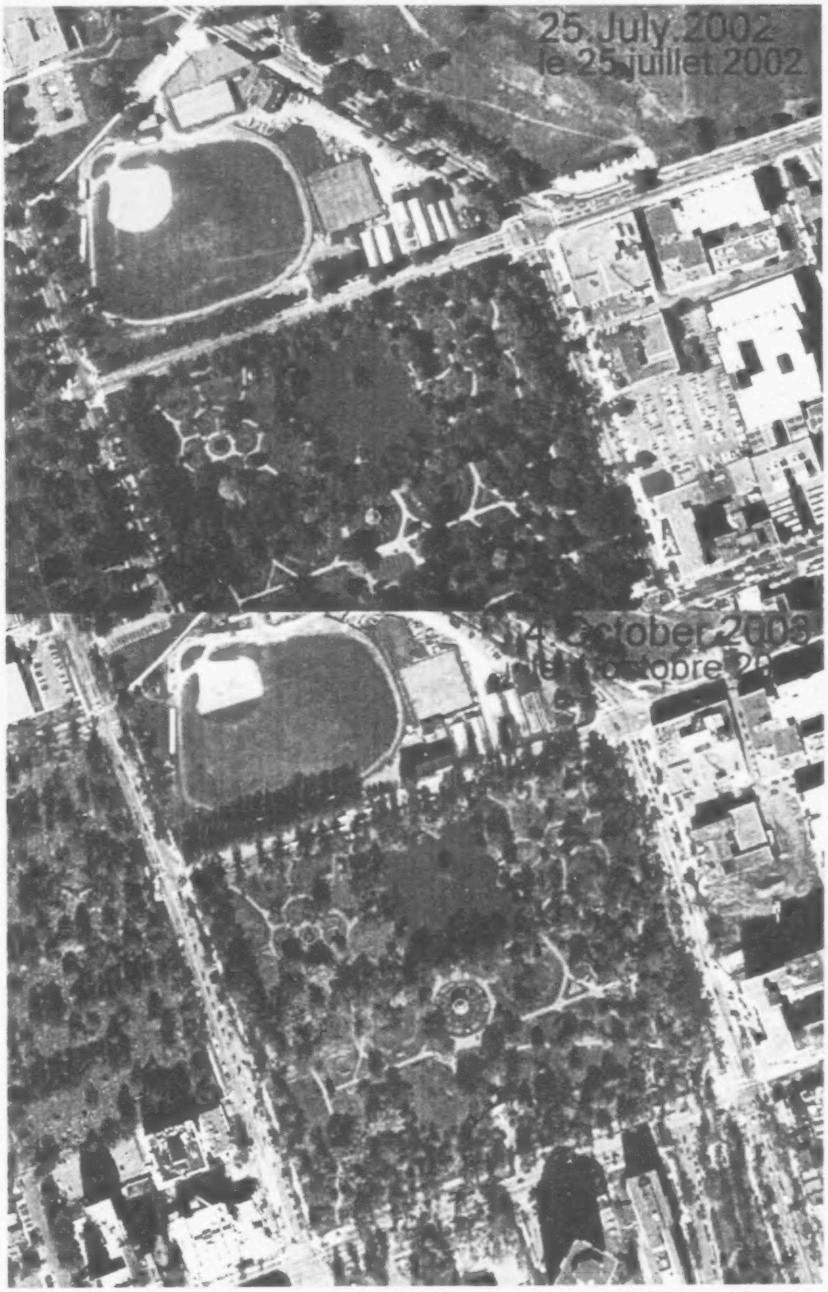
Prospect, Nova Scotia.
Photo: Doug Mercer



High definition photo of tree damage on McNab's Island at the tip of Halifax Harbour.
Photo: HDI Inc. for Environment Canada



High definition photo of tree damage at Point Pleasant Park in Halifax.
Photo: HDI Inc. for Environment Canada


25 July 2002
le 25 juillet 2002
4 October 2003
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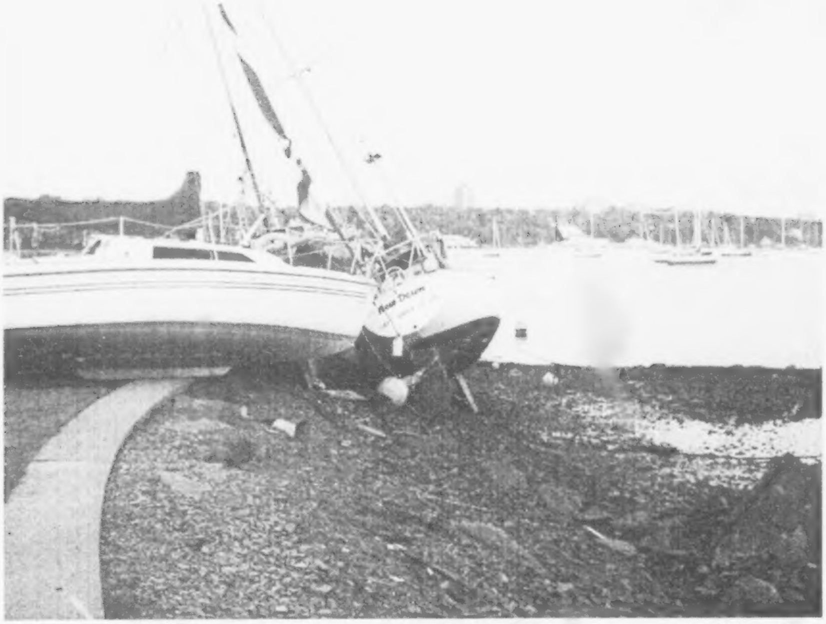
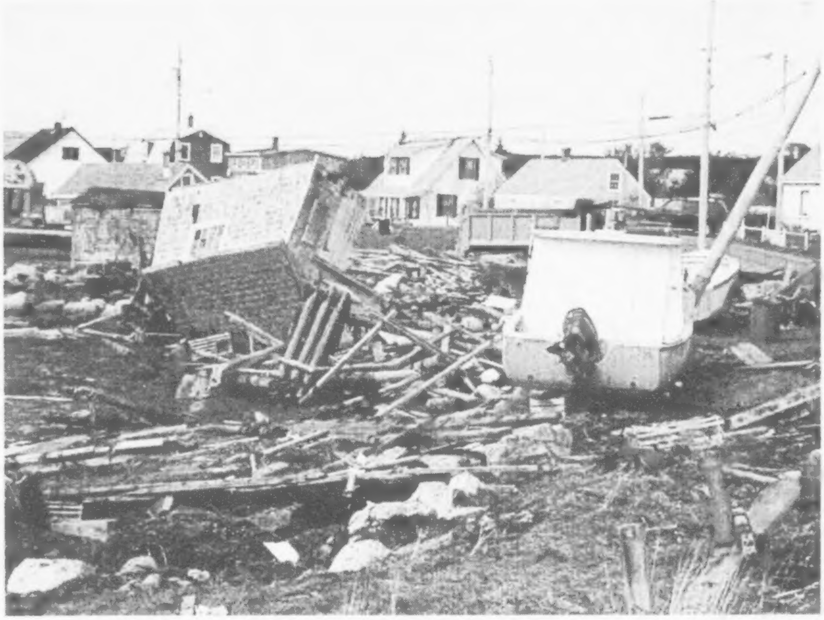
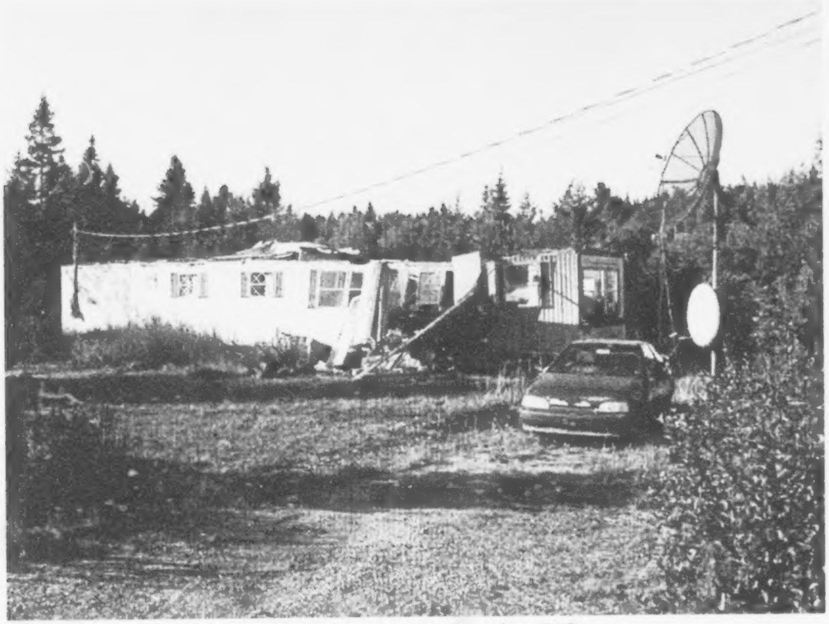
High definition before and after photo of tree damage in the Halifax Public Gardens.
Photo: HDI Inc. for Environment Canada



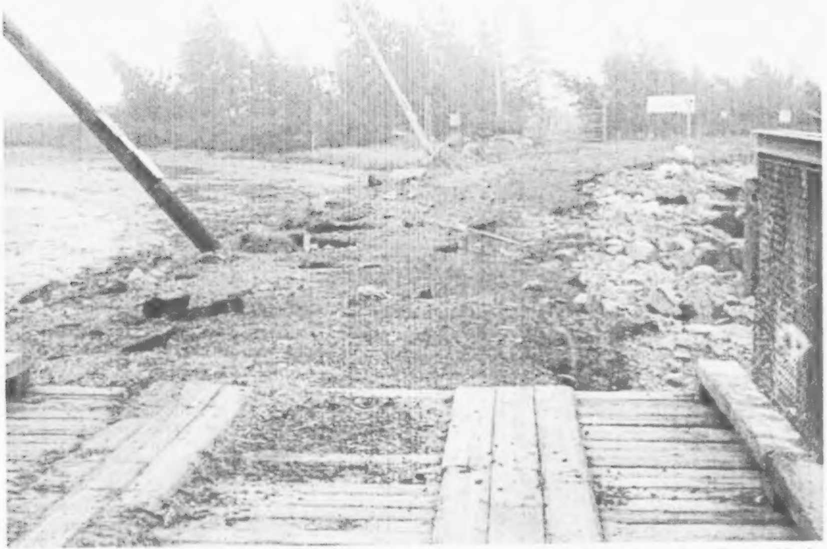
Sailboats washed ashore by the hurricane in the Northwest Arm of Halifax Harbour.
Photo: Doug Mercer



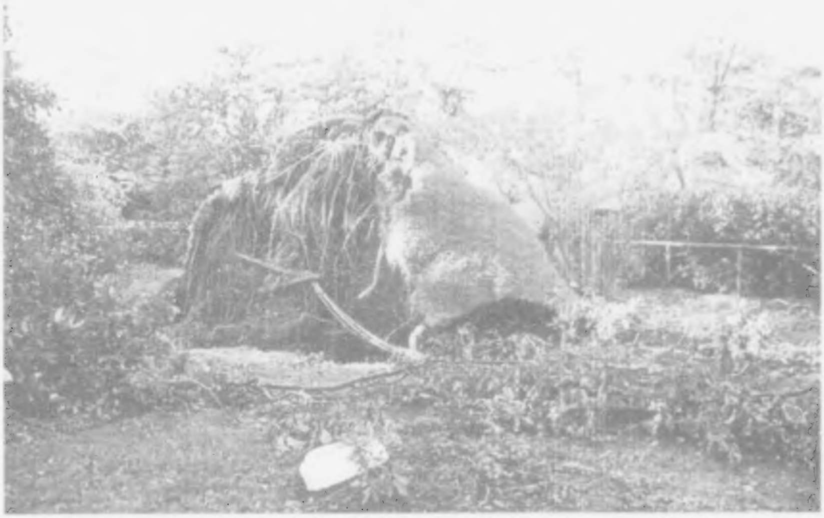
Prospect NS.
Photo: Doug Mercer



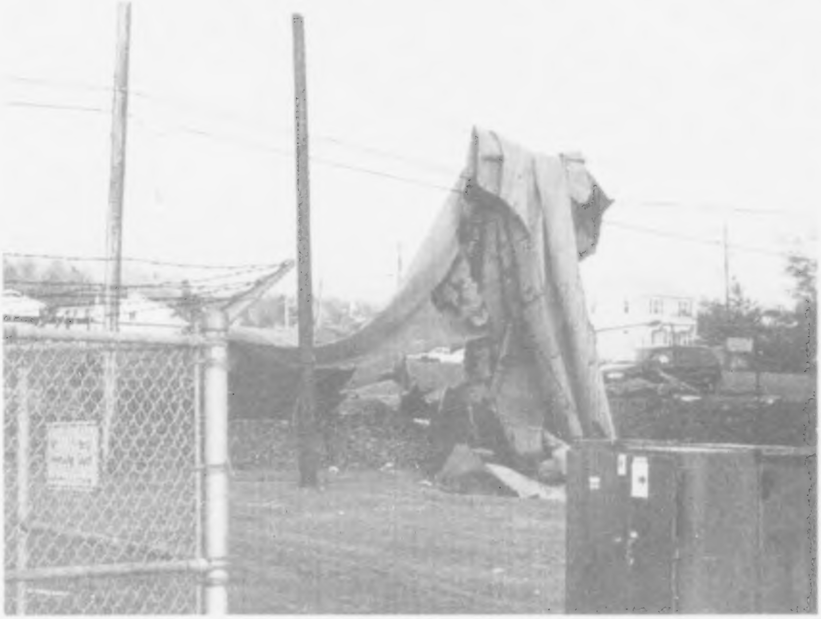
Mobile home near Sambro NS.
Photo: Doug Mercer



Dyke Road running from Bissett Road and Cow Bay Road to the Gun Club.
(behind Rainbow Haven Provincial Park)
Photo: Doug Mercer



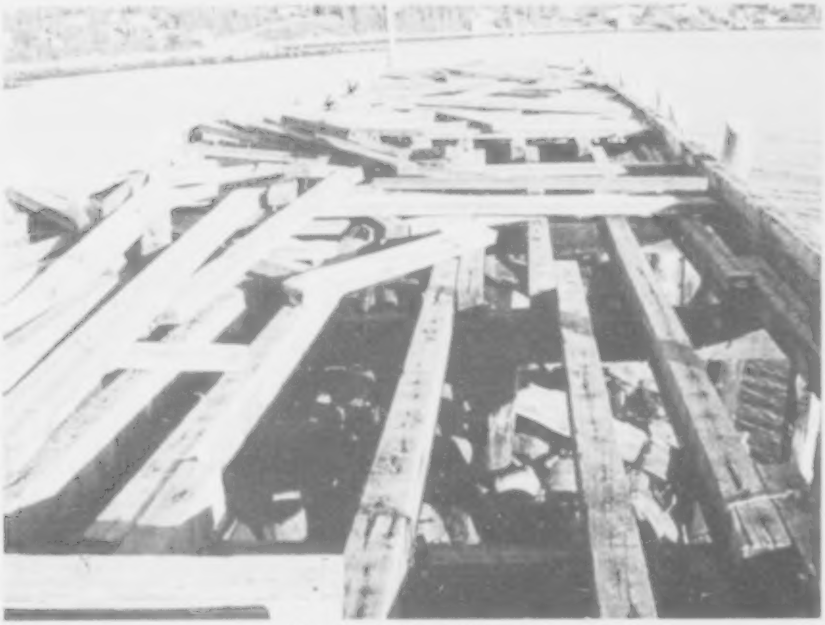
Close up view of trees in the Halifax Public Gardens toppled by Juan.
Photo: Chris Fogarty.



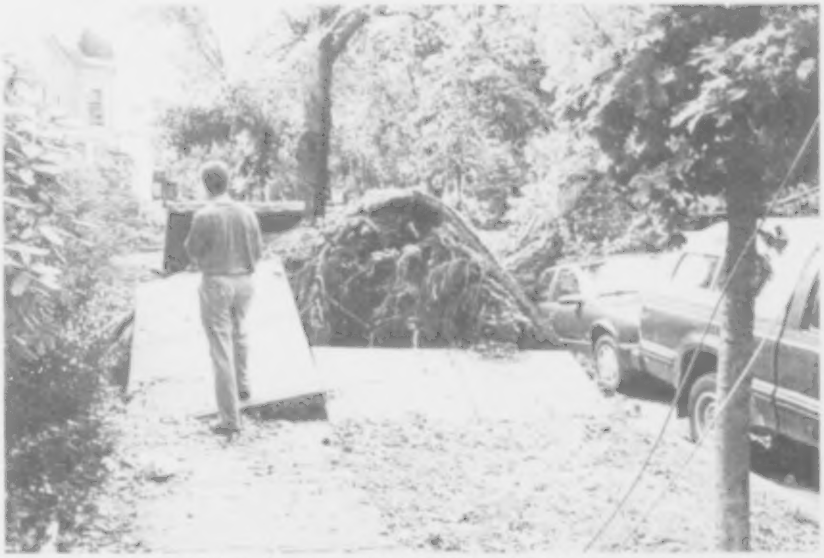
Power outages were also caused by roofing material landing on power lines.
Photo: Doug Mercer

Trees near Beaverbank NS blown over.
Photo: Chris Fogarty

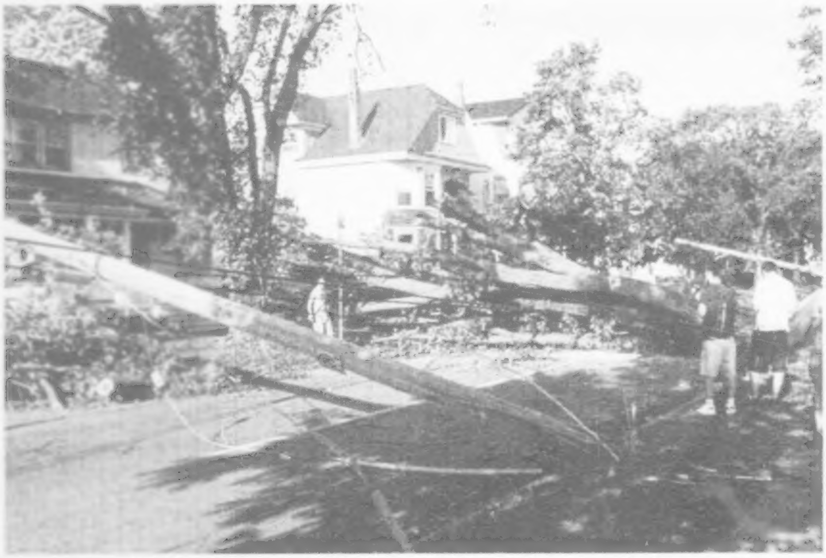
Several schools like this one in Eastern Passage suffered damage.
Photo: Chris Fogarty



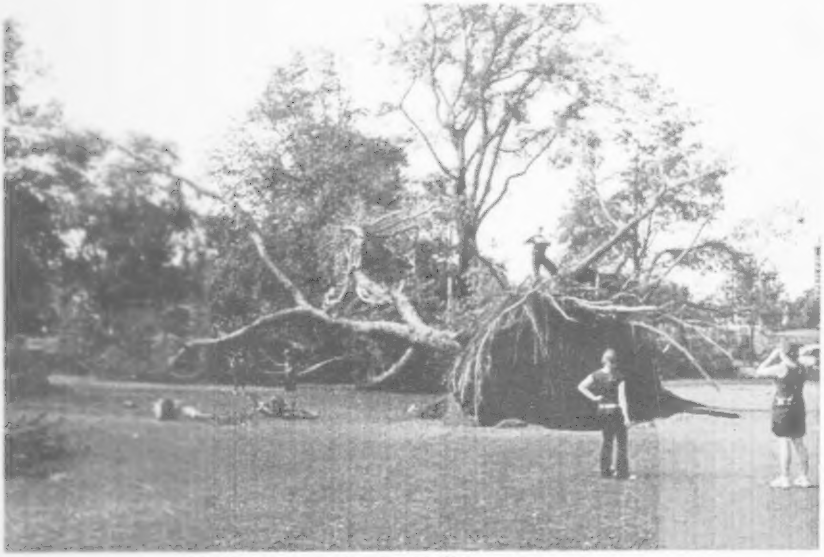
Ketch Harbour Wharf.
Photo: Doug Mercer.



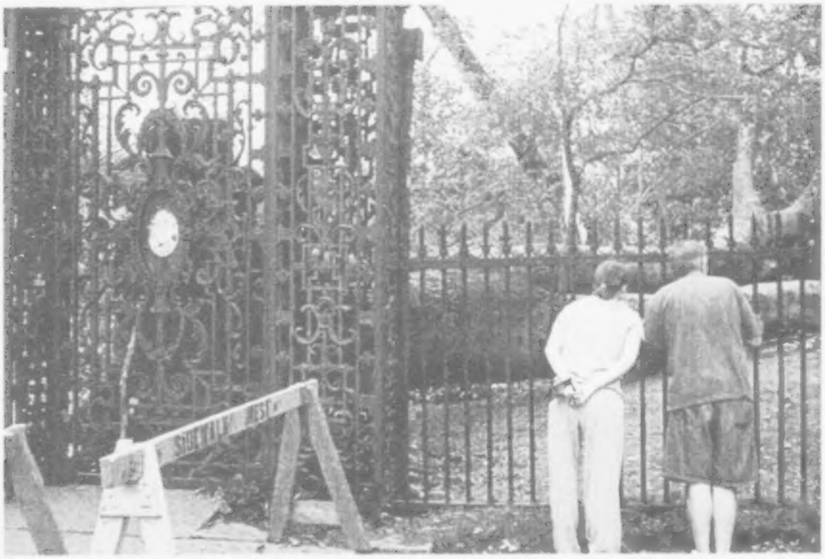
Many sidewalks were impassable after the hurricane.
Photo: Pete Young



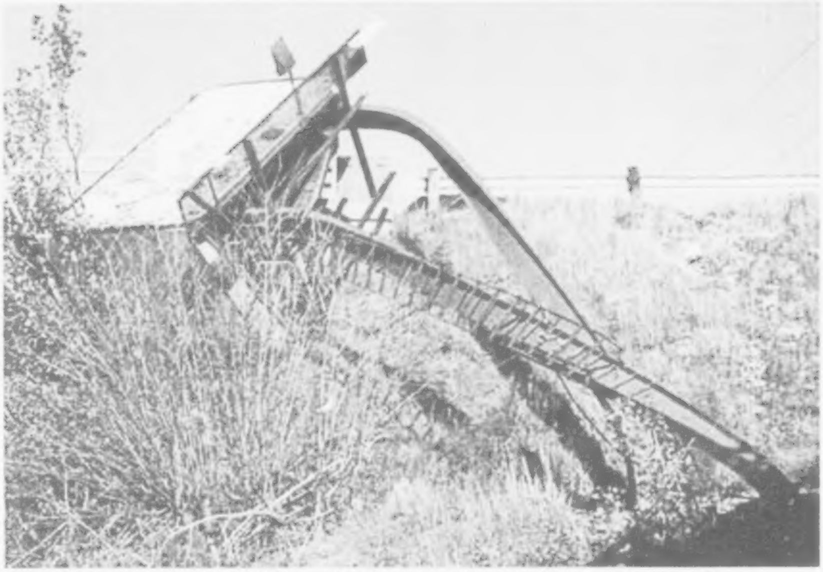
Jubilee Road in Halifax was closed for several days.
Photo: Pete Young



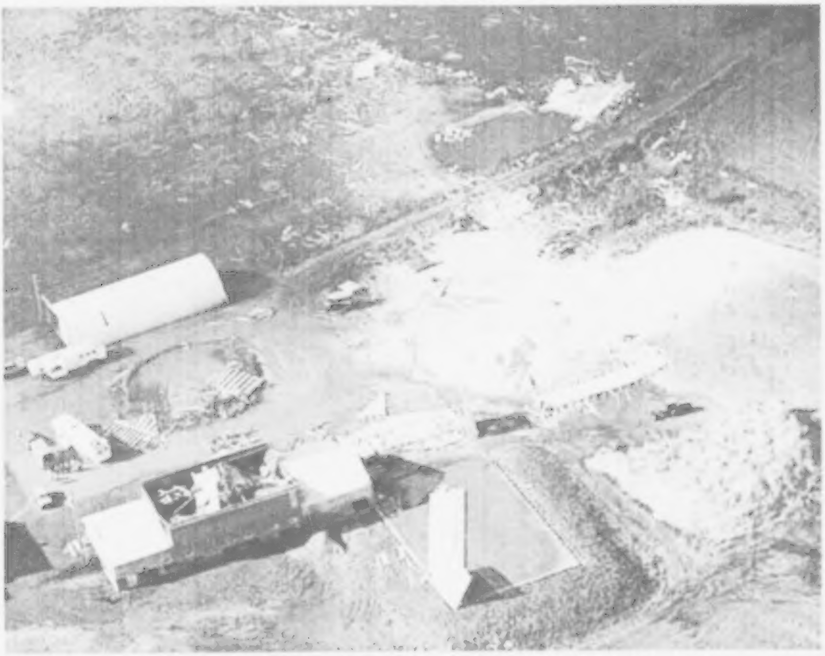
A fallen tree in the Halifax Commons.
Photo: Pete Young



Fallen trees block the entrance to the Halifax Public Gardens.
Photo: Pete Young



Steel legs on this biliboard twisted and caused the sign to collapse.
Photo: Chris Fogarty

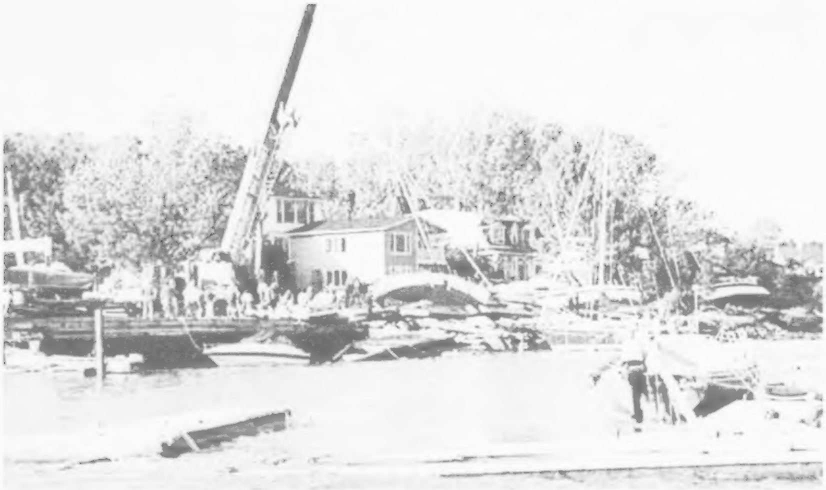


A farm near Truro NS destroyed by Hurricane Juan.
Photo: Len Wagg

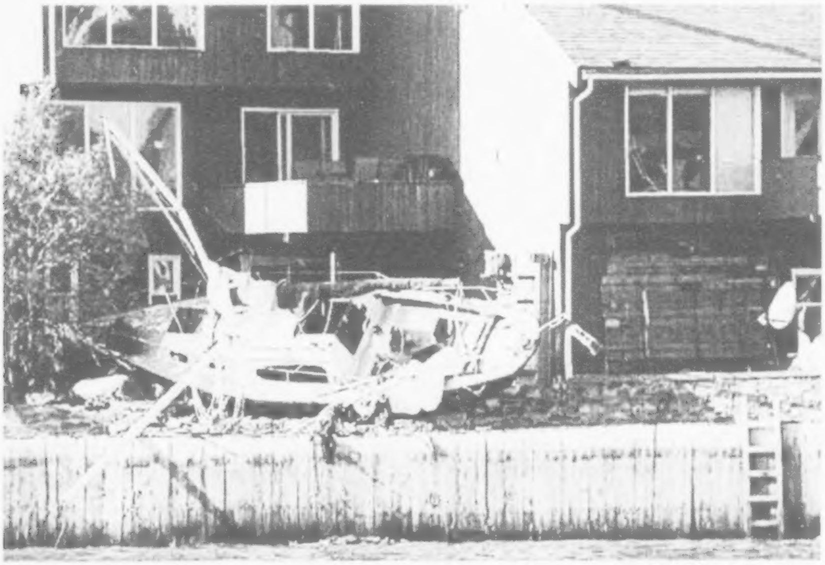
Juan's winds moved this barn 45cm and forced the owners
to destroy it because of safety concerns.
Photo: Len Wagg

Point Pleasant Park.
Photo: Len Wagg

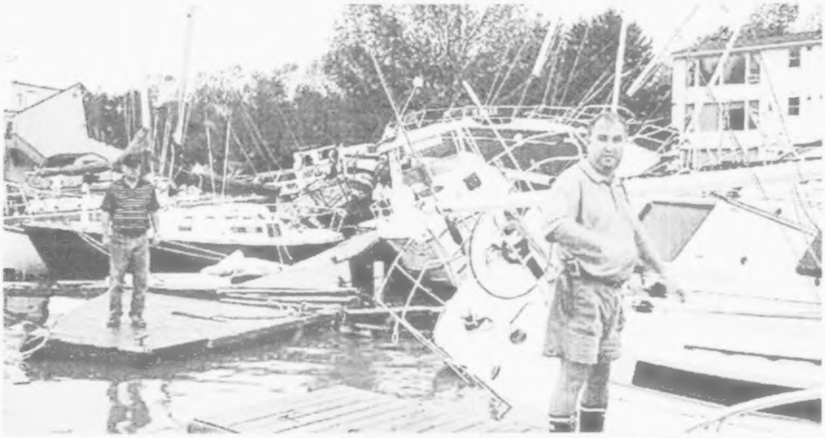
Point Pleasant Park.
Photo: Len Wagg



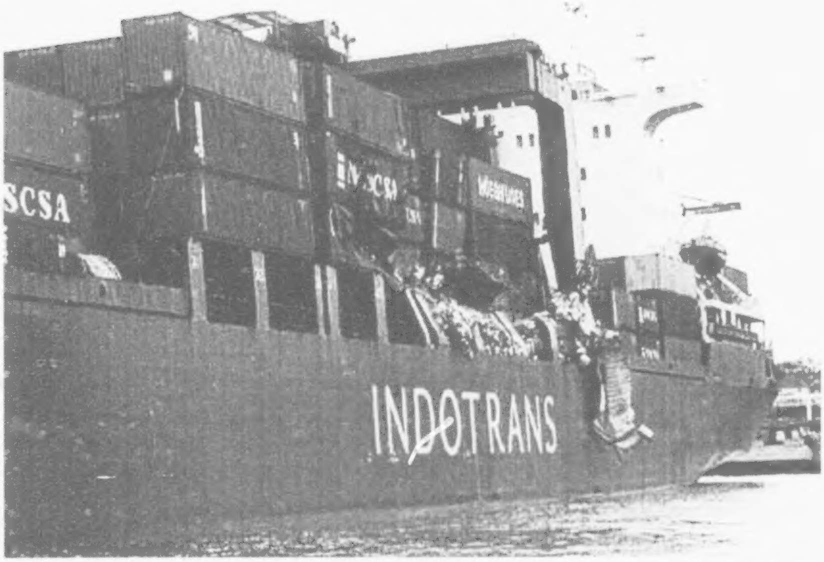
Submerged and grounded boats at the Bedford Yacht Club being righted by a crane.
Photo: Roger Percy and Andre Laflamme



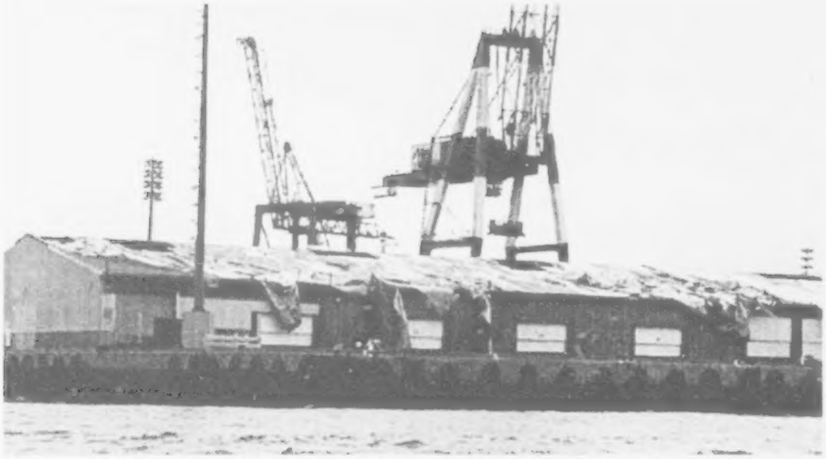
The storm surge tosses this sailboat into a house along the Bedford Basin.
Photo: Roger Percy and Andre Laflamme



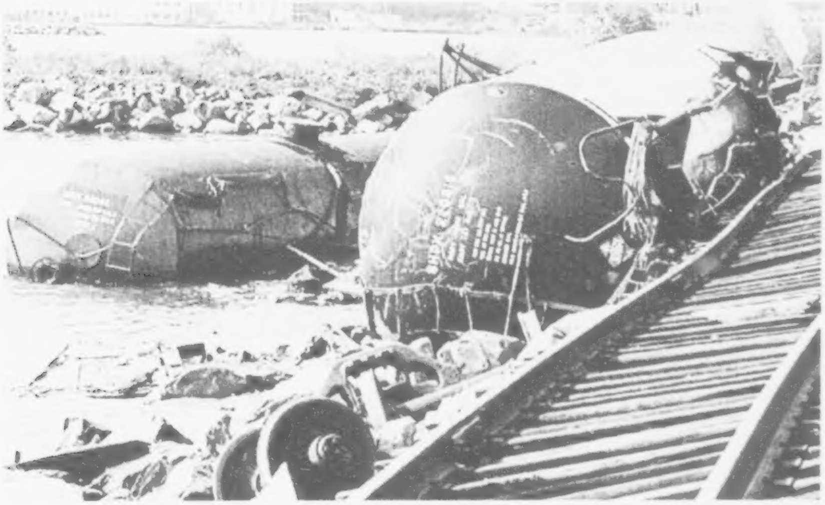
Close up view of the damage at the Bedford Yacht Club.
Photo: Gary Dunbrack



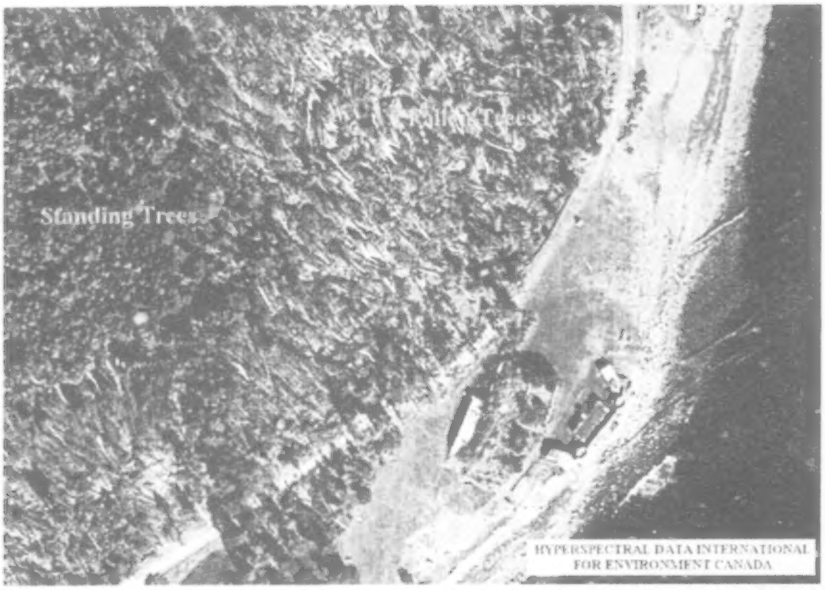
This container ship arrived in Halifax after battling Hurricane Juan at sea.
Photo: Roger Percy and Andre Laflamme



Damage to a warehouse along the Halifax waterfront.
Photo: Roger Percy and Andre Laflamme



The storm surge washed out train tracks and caused these
railcars to slide into Halifax Harbour.
Photo: Roger Percy and Andre Laflamme


Fallen Trees
Standing Trees
HYPERSPECTRAL DATA INTERNATIONAL FOR ENVIRONMENT CANADA

"Before and after" high definition photo of tree damage at Point Pleasant Park in Halifax.
Photo: HDI Inc. for Environment Canada

2003–Kate

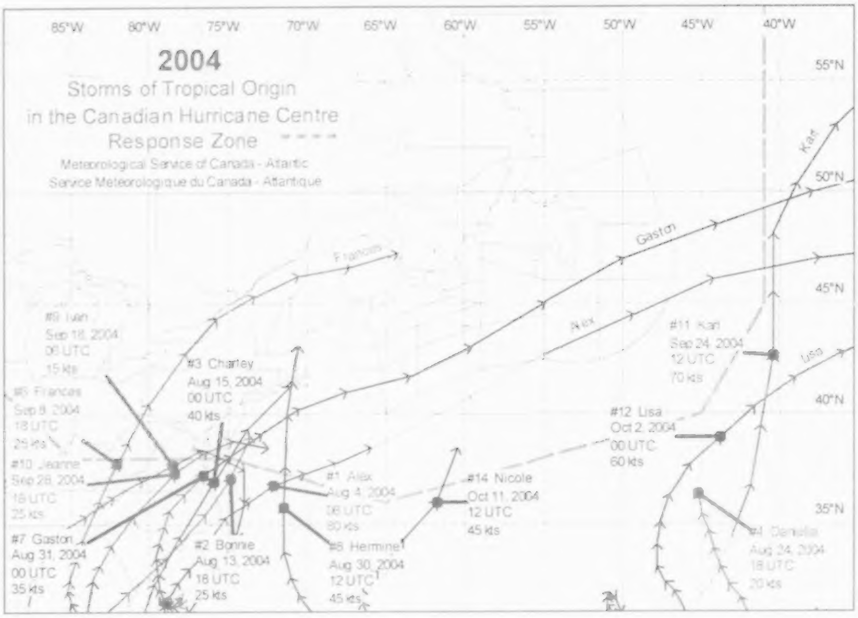
Hurricane Kate was in the CHC Response Zone October 6-8. Kate entered the Response Zone as a category one hurricane and was at tropical storm strength as it moved through the Southeastern and Northern Grand Banks of Newfoundland. Rainfall from Kate was difficult to determine because tropical cyclone moisture was feeding into a stalled frontal system over the province of Newfoundland. The 24 hour radar derived storm total rainfalls calibrated against surface reports suggest upwards of 100 mm (3.9 in) in some regions of southeastern Newfoundland from the combined effects of these two features. The CHC issued 22 bulletins.

NEWFOUNDLAND

October 7, 2003

- St. John's received 45.2 mm (1.8 in) of rain on October 6, 2003 breaking the previous record of 27.6 mm (1.1 in) in 1994 (CBC)
- Winds of 120 km/h (65 knots) were reported offshore and did not affect the island (CBC)

2004 – MAP


85°W
80°W
75°W
70°W
65°W
60°W
55°W
50°W
45°W
40°W
55°N
50°N
45°N
40°N
35°N
2004
Storms of Tropical Origin
in the Canadian Hurricane Centre
Response Zone
Meteorological Service of Canada - Atlantic
Service Meteorologique du Canada - Atlantique
Frances
Gaston
Alex
Karl
Lisa
#9 Ivan
Sep 18, 2004
06 UTC
15 kts
#3 Charley
Aug 15, 2004
00 UTC
40 kts
#6 Frances
Sep 8, 2004
18 UTC
25 kts
#10 Jeanne
Sep 28, 2004
18 UTC
25 kts
#7 Gaston
Aug 31, 2004
00 UTC
35 kts
#2 Bonnie
Aug 13, 2004
18 UTC
25 kts
#1 Alex
Aug 4, 2004
06 UTC
80 kts
#8 Hermine
Aug 30, 2004
12 UTC
45 kts
#14 Nicole
Oct 11, 2004
12 UTC
45 kts
#11 Karl
Sep 24, 2004
12 UTC
70 kts
#12 Lisa
Oct 2, 2004
00 UTC
60 kts
#4 Danielle
Aug 24, 2004
18 UTC
20 kts

2004–Alex

Hurricane Alex originated on July 31st off the northeast coast of Florida. The storm intensified into a category 3 hurricane as it travelled along the coastline of United States and entered the Canadian Response Zone on August 4th. Hurricane Alex deepened to a minimum central pressure of 95.7 kPa (957 mb) with sustained winds reaching 195 km/h (105 knots) while passing 350 km (220 miles) south of Nova Scotia. This made Alex only the 2nd tropical cyclone to reach major hurricane status at such a northerly latitude. Alex continued to travel through the response zone and over the Grand Banks before dissipating on August 6th. The CHC issued 26 Hurricane Information Statements.

- Alex created 10 m (32.8 ft) seas and 1 m (3.28 ft) sea swells off southern Newfoundland (TTWS04)

August 4, 2004

- Hurricane Alex was recorded as the strongest major hurricane to develop north of the 38 degree latitude. Alex's maximum sustained winds were measured at 195 km/h (105 knots) at that location (NHC)

2004–Bonnie † (1 Canadian fatality)

Tropical Storm Bonnie originated north of the Yucatan Peninsula in the Gulf of Mexico on August 9th, 2004. Bonnie intensified to tropical storm strength with maximum winds reaching 101 km/h (55 knots) before making landfall along the Florida panhandle on August 12th. However, the remnants of Tropical Storm Bonnie continued moving northward, over the Appalachian Mountains and developed into an extra-tropical low off the New Jersey coast. The remnant low tracked through the Maritimes where it combined with a mid-altitude weather system approaching from the west. The combined weather system produced heavy rains—with amounts as high as 90 mm (3.5 in) in Edmunston—over northwestern New Brunswick which resulted in flooded basements, drainage backups, and road washouts and closures. One storm-induced traffic fatality was reported from Edmunston, New Brunswick. The CHC issued 5 Hurricane Information Statements.

- Fredericton received a total of 75 mm (2.95 in) of rain and Edmundston received as much as 90 mm (3.5 in) (TTWS04)
- The St. John River rose to springtime water levels (TTWS04)

New Brunswick

August 14, 2004

- Tropical Storm Bonnie brought heavy rain to the province of New Brunswick causing road closures and flooding (SS)
- The north-western region of the province was affected most (SS)
- Edmundston received rainfall totals reaching 80mm (3.1 in) (CTV)
- Grand Falls received approximately 35 mm (1.4 in) of rain (SS)
- Saint Leonard received nearly 35 mm (1.4 in) (SS)
- In Clair, storm and sanitary sewers were overflowing (SS)
- Reports of basement flooding along the Edmundston region were numerous (HDN)
- Route 120 in Baker Brook (between Edmundston and Clair) had sections of the road washed away forcing motorist to take an alternate route (HDN)
- Flooding occurred in the Iroquois River area (HDN)
- The Bowater mill was forced to evacuated (G)
- In Edmundston the St-Jacques area was flooded (G)
- Riviore-E-al-Truite Rd., Mont Farlagne Rd., Reservoir St., and Demers St. were closed (G)
- A road located in Clair Industrial Park was flooded (G)
- Fredericton received 30 mm (1.2 in) of rain (G)
- St. Stephen received approximately 30 mm (1.2 in) of rain (G)

- Flood waters in regions of Clair reached 4.5 m (15 ft) deep (G)
- Firewood, which a resident of Clair had stored away was floating within the flood waters nearby (G)

August 15, 2004

- A Quebec man was killed when his vehicle overturned while attempting to cross a stream in Baker Brook near Edmundston. The other passenger of the vehicle was able to escape. Heavy rain due to the remnants of Tropical Storm Bonnie are believe to be the cause of the flash flooding in the region (HDN)
- Madawaska and Restigouche areas of New Brunswick received as much as 70 mm (2.8 in) of rain (HDN)
- Main roads in the Riviere-Verte area east of Edmundston were washed away by heavy rains (HDN)

August 16, 2004

- The Second Falls Rd. in St. Joseph-de-Madawaska was closed (TJ)
- A section of the Rang 8 road was washed away and deemed unsafe for public travel (TJ)

August 17, 2004

- Severe flooding to potato farms in the Madawaska County region destroyed acre's of potato crops and brought a potential risk of potato blight (TJ)
- The Cote-a-Blanchette and the Chemin des Chalets roadways remained closed due to flooding (TJ)

August 25, 2004

- The city of Edmundston reported *$486,000* in damages to city infrastructure due to Tropical Storm Bonnie. Road network damages contributed to a significant portion of this total value (TJ)

August 31, 2004

- Areas between Rolling Dam and St. George also experienced flooding (TJ)

October 1, 2004

- Storm damage was estimated to cost more than *$3 million* (TJ)

November 16, 2004

- Association des Sentiers du Nord-Ouest (ASNO) snowmobile trails in Madawaska County were damaged due to flooding (TJ)

November 22, 2004

- New Brunswick Emergency Measures Office received 51 claims for assistance due to damages caused by Tropical Storm Bonnie (TJ)

2004–Charley

Hurricane Charlie developed in the Caribbean Sea on August 9th, 2004. Charley intensified into a category 4 hurricane carrying maximum sustained winds of 231 km/h (125 knots). After making landfall in Florida, Charley continued along the north east coast of United Stated but weakened significantly. Upon entering the Canadian Response Zone on August 15th Charley was downgraded to tropical storm status as the remnant surface low merged with a frontal system moving through the Maritimes on August 15 bringing local periods of strong winds (less than 65 km/h or 35 knots) and heavy rains. As a tropical storm, Charley quickly weakened and dissipated later that same day with no substantial effects on Canada apart from a brief interruption in some marine activities. The CHC issued 15 Hurricane Information Statements.

New Brunswick

August 16, 2004

- The remnants of Hurricane Charley forced the Tall Ships Parade to delay their departure from Saint John (TJ)

2004–Frances

Hurricane Frances began on August 25th, 2004 in the mid-Atlantic Ocean and intensified into a category 4 hurricane. Frances contained maximum winds reaching 231 km/h (125 knots) and deepened to a central pressure of 93.6 kPa (936 mb) during its maximum strength. Hurricane Frances began tracking northwest, passing over the Bahamas and Florida before beginning to curve northeastward and head towards Canada. Frances entered the Canadian Response Zone on September 9th as a post-tropical cyclone with winds of 28 km/h (15 knots), however, winds strengthened briefly back to gale force (65 km/h or 35 knots) as it passed over the eastern portion of Lake Ontario. Although the storm centre never actually entered Canadian territory, very heavy rain to the north of the storm caused widespread flooding throughout communities in southeastern Ontario. The nation's capital received a record 135 mm of rain with the highest amount of 137 mm reported from Kingston. In late 2004 the Insurance Bureau of Canada estimated more than $45 million in Ontario insurance claims had already been submitted. The remnant low continued through eastern Canada delivering 50-70 mm north of its track. Localized flooding and road washouts were reported in the provinces of Quebec, New Brunswick, and Newfoundland. No fatalities were recorded. The CHC issued 6 Hurricane Information Statements.

Some Environment Canada meteorological data from a special storm summary issued by the Ontario Storm Prediction Centre on September 9, 2004:

Local Time	Location	Rainfall Amount
08:00 AM	Bancroft	15.6 mm (0.61 in)
02:00 PM	**Cobourg	82.2 mm (3.23 in)
09:00 PM	Cornwall	82.0 mm (3.22 in)
08:00 AM	Curran	145.0 mm (5.70 in)
08:00 AM	Delhi	26.2 mm (1.03 in)
08:00 AM	Elora	18.2 mm (0.72 in)
08:00 AM	Erieau	15.6 mm (0.61 in)
08:00 AM	Fort Erie	85.0 mm (3.34 in)
10:30 AM	Grimsby	64.3 mm (2.53 in)
02:00 PM	Hamilton	32.0 mm (1.25 in)
08:00 AM	Kaladar	31.4 mm (1.23 in)
02:00 PM	**Kingston	137.0 mm (5.39 in)
02:00 PM	North Gower	85.4 mm (3.36 in)
02:00 PM	Oshawa	51.2 mm (2.01 in)
02:00 PM	**Ottawa	135.4 mm (5.33 in)
02:00 PM	Peterborough	50.2 mm (1.97 in)
08:00 AM	Port Colborne	96.0 mm (3.77 in)
08:00 AM	Stirling	63.2 mm (2.48 in)
02:00 PM	Toronto (Buttonville)	22.2 mm (0.87 in)
02:00 PM	Toronto (Downtown)	29.0 mm (1.14 in)
02:00 PM	Toronto (Island)	32.0 mm (1.26 in)
02:00 PM	Toronto (Pearson)	23.0 mm (0.90 in)
02:00 PM	**Trenton	111.8 mm (4.40 in)
08:00 AM	Vineland (Niagara)	57.4 mm (2.26 in)
02:00 PM	Waterloo	21.0 mm (0.82 in)

Note: ** Represents a new one-day rainfall record.

Quebec

- L'Assomption received 96 mm (3.8 in) of rain (TTWS04)
- Gaspe received 83 mm (3.3 in) of rain (TTWS04)
- High Falls received 100 mm (3.9 in) of rain (TTWS04)
- Montreal received 67 mm (2.6 in) of rain (TTWS04)
- Quebec received 66 mm (2.6 in) of rain (TTWS04)
- L'Etape Parc des Laurentides received 81 mm (3.2 in) of rain (TTWS04)
- St-Jovite received 99 mm (3.9 in) of rain (TTWS04)

- Shawinigan received 86 mm (3.9 in) of rain (TTWS04)

Newfoundland

September 14, 2004

- Heavy rain was reported along the western coast of Newfoundland (ET)
- Deer Lake reported 71 mm (2.8 in) of rain (ET)
- Stephenville reported 60 mm (2.4 in) of rain (ET)
- A road way leading to Trout River was closed due to washouts near Feeder Brook (ET)
- There were reports of water problems on the Trans-Canada Highway near Hampden Brook (ET)
- In Rocky Harbour, flooding occurred along the north side of the community (ET)
- Route 340 was flooded in the Deer Arm area (ET)

Quebec

September 10, 2004

- Montreal received 60 mm (2.4 in) of rain during the storm (MG)
- The Outaouais region of Quebec received approximately 120 mm (4.7 in) of rain (MG)
- Quebec City and Mauricie regions received between 60-75 mm (2.4-3.0 in) (MG)

September 11, 2004

- Road sectors in Gatineau were closed as water levels began to rise (HDN)

New Brunswick

September 13, 2004

- Heavy rain from Hurricane Frances created favorable conditions for mosquito reproduction and many New Brunswick residence have been noticing a higher than normal mosquito population (TJ)

September 15, 2004

- RCMP were forced to postpone their search for a missing sailor in the waters off Lameque Islands as heavy seas made the conditions unsafe for divers. Only the search delay was a result of the storm as the accident happened prior to the storm (HH)

Ontario

September 15, 2004

- Downtown Toronto received 30 mm (1.3 in) of rain (NP)
- Person International Airport received less than 20 mm (0.8 in) of rain (NP)

September 18, 2004

- The Insurance Board of Canada estimated that *$18 million* in damages were caused by the by storm from Kingston to Ottawa (KWS)

September 27, 2004

- Lake Ontario rose nearly 0.08 m (3.1 in) on September 9, 2004 and 0.03 m (1.2 in) on September 10, 2004 for a total rise of 0.11 m (4.3 in) due to heavy rain from Hurricane Frances (SLRB)

Ottawa Region

September 9, 2004

- In Ottawa, a roof of an apartment collapsed (CTV)

September 10, 2004

- Parliament Hill Peace Tower was forced to cancel the scheduled tours of the building due to leaking (SP)
- The swank restaurant for Members of Parliament (MP's) and Senators on Parliament Hill reported leaking (SP)
- The first round of the Canadian Open Golf Tournament was delayed due the high winds and heavy rains (OC)
- Ottawa Airport received 129 mm (5.1 in) of rain breaking their previous record of 80 mm (3.1 in) of rain in a single day (OC)
- Brookside Manor was flooded with nearly 1 m (3.2 ft) of water in its basement and 75 residence were forced to evacuate (OC)
- Shirley's Brook was flooded to nearly 4 times its normal volume (OC)
- Water was reported to be knee deep on Laperierre and Clyde Ave. (OC)
- Moodie Dr. was closed and cars were stalled on Fitzgerald Rd. (OC)
- All sport fields in Ottawa were closed (OC)
- O-Train was forced to stop service because of track flooding in the Carleton University area and Walkley Rd. (OC)
- National Capital Commission (NCC) closed the Tockcliffe Parkway between Birch Ave. and the Aviation Parkway (OC)
- Parliamentary Press Gallery received minor flooding (NP)
- Ottawa received 135 mm (5.3 in) of rain (CBC)
- 3000 people in the Gananoque region were placed on a water boil order (CBC)

- A volunteer weather watcher reported 160 mm (6.3 in) of rain on Missippissi Lake, south of Carleton Place (OC)

September 11, 2004

- 17 car accidents were reported by Ottawa Police during the heavy rain (HDN)
- Ottawa Hydro disconnected power to one region of the city as a safety precaution (HDN)
- A residence on Nelson St. reported that 0.18 m (0.6 ft) of water flooded into her basement (OC)

September 16, 2004

- Heavy rains caused the March Rd. pumping station to be shut down which eventually caused flooding and sewage backups in the Shirley's Brook neighborhoods of Sandy Hill, South Keys, Meadowlands, St. Claire Gardens, Henson Park, Skyline, Parkwood Hills, Fisher Heights and Rideau Gardens. More than 50 homes were damaged due to the sewage backup (OC)
- Reports that 120-180 mm (4.7–7.1 in) of rain fell throughout areas of the city, with an average amount of 142 mm (5.6 in) (OC)

Kingston Region

September 9, 2004

- Two schools were closed in Kingston due to weather conditions (CTV)

September 10, 2004

- Highway 401 sustained damages due to flooding (CBC)
- Homes on Princess St. were flooded (KWS)
- An accident occurred on Bath Rd. in Amherstview which was believed to be weather related (KWS)
- A Canada Post truck slid off Highway 62 in Prince Edward County (KWS)
- Flooding occurred in the King St., Ontario St., Queen Mary Rd., and Place d'Armes areas (KWS)
- Gardiners Rd. was closed to traffic due to extremely high water pools under the train overpass between Bath Rd. and Development Dr.. Two vehicles were stranded in this area (KWS)
- Collins Creek overflowed its banks (KWS)
- 1,600 Hydro One customers in Kingston, Napanee, Storrington, Loughborough, Wolfe Island, Ernestown and Howe Island lost power due to trees falling on power lines (KWS)
- Limestone District School Board closed the following public schools due to power outages: Glenburnie, Land O'Lakes, Clarendon Central, and JR Henderson (KWS)

- Algonquin and Lakeshore Catholic District School Boards did not close their respective schools but reported that some leaks had occurred (KWS)
- The downtown Kingston and Frontenac Public Library experienced flooding. Hundreds of books had to be moved and rain was leaking inside the children's department through a skylight (KWS)

September 11, 2004

- Winds were gusting to a reported 70 km/h (38 knots) (HDN)
- The storm brought 37.5 mm (1.5 in) of rain within a 12 hour period (HDN)
- A section of the artery between Montreal Rd. and Highway Exit 15 was reduced to one lane as repairs were needed to the road due to flood damage (HDN)

September 18, 2004

- 91 insurance notices were presented to the City of Kingston (KWS)

September 23, 2004

- Professional cleanup firms were assisting more than 1000 customers within the city of Kingston (KWS)
- Kingston's water supply had to discharge more than 109 million litres of raw sewage and storm water in Lake Ontario and Cataraqui River because the city's sewer drainage system could not handle the extreme flow of water. The wastewater was re-routed and bypassed treatment stations (KWS)
- Pumping stations were also affected by power outages (KWS)

October 8, 2004

- Kingston waste officials estimated that the final bill to help homeowners with their clean up during Hurricane Frances will reach ***$35,000***.

2004–Gaston

Hurricane Gaston formed off the coast of Georgia on August 27, 2004. Gaston was originally classified as a tropical storm. However, upon reanalysis of storm data The National Hurricane Center reclassified Gaston as a category 1 hurricane. After moving inland over South Carolina, Gaston began to turn northeast and enter the Canadian Response Zone on August 31st as a tropical storm, moving into Canadian waters late in the day. Maximum winds in the Response Zone reached 83 km/h (45 knots) as the system tracked south of Nova Scotia and Newfoundland, eventually dissipating on September 2nd. Gaston completed the transition from its tropical to extratropical phase as it passed south of Sable Island on the morning of September 1. Heavy rain north of Gaston just missed mainland Nova Scotia but fell at Sable Island which recorded 72 mm in four hours (35 mm in one hour). No significant impacts were reported from Canadian waters or territory. The CHC issued 20 Hurricane Information Statements.

September 1, 2004

- Storm passing 150 km (93 miles) offshore (G)
- Winds reaching 65 km/h (35 knots) (G)

2004–Hermine

Tropical Storm Hermine was developed on August 27th, 2004 south of Bermuda. Hermine intensified into a tropical storm carrying maximum sustained wind reaching 94 km/h (50 knots). While entering the Canadian Response Zone on August 31st Tropical Storm Hermine contained winds reaching 83 km/h (45 knots). A weak interaction with Tropical Storm Gaston caused Hermine to weaken as it tracked towards Cape Cod, following which, it became extratropical. The remnant low centre tracked up the Bay of Fundy on August 31, making landfall in New Brunswick, bringing locally heavy rain to portions of southern New Brunswick which received 40–55 mm. Minor basement flooding and street closures were reported from Moncton, New Brunswick. The CHC issued 7 Hurricane Information Statements.

New Brunswick

September 1, 2004

- Moncton received 55 mm (2.2 in) of rain which caused minor basement flooding and street closures (G)
- Cornell St. in Moncton was flooded as storm sewers began to overflow (CTV)
- A traffic circle located in the west side of Moncton was closed twice during the day due to flooding in the area (TJ)
- Wheeler Boulevard in Moncton was deemed impassable due to 0.6 m (2 ft) of water build-up (TJ)
- Saint John received 44.2 mm (1.7 in) of rain (TJ)
- Point Lepreau received 54.9 mm (2.2 in) of rain (TJ)
- Fredericton and Bathurst received approximately 40 mm (1.6 in) of rain (TJ)

2004–Ivan † (6 Canadian fatalities)

Hurricane Ivan originated on September 2nd, 2004 off the Cape Verde Islands in the Atlantic Ocean. Hurricane Ivan intensified into a category 5 hurricane with maximum sustained winds reaching 268 km/h (145 knots). Ivan was an interesting hurricane to note. The storm was the strongest major hurricane ever recorded in low latitude regions. Ivan's track reached as far south as the 8.9 degree latitude. Ivan eventually entered the Gulf of Mexico and made landfall along the coast of Alabama. Ivan drifted northward over the Appalachians, where it rained itself out in tremendous downpours, and the storm system dissipated to near extinction.

After wrecking havoc through the Caribbean and United States, Ivan weakened to a tropical depression prior to becoming extratropical inland on August 18 as it reached as far north as the Response Zone. The often-difficult-to-find surface remnants of Ivan then turned east and moved through southern Maryland before heading offshore and turning back south, eventually moving through Florida and back into the Gulf of Mexico where it was once again declared to be a tropical storm. As the remnant surface circulation of Ivan was turning back south on August 18-19, the mid-upper atmospheric moisture and circulation continued northeastward along a frontal system and fed directly into a developing mid-latitude storm over Atlantic Canada. The result was a powerful 4-day storm which became one of the most significant weather events in Atlantic Canada in 2004. High winds—gusting as high as 143 km/h along the northeast coast of Newfoundland—were responsible for tree blowdowns and power outages in Prince Edward Island, Newfoundland, and eastern Nova Scotia. Heavy rainfall reached its peak in Newfoundland where three different observing sites each reported in excess of 150 mm (Gander reported 91 continuous hours of precipitation giving 157.6 mm). Seas were estimated to be near 8 m in the Cabot Strait while public reports were received of 15-m swells near Cape Bonavista. Two crewmembers onboard the fishing vessel *Ryan's Commander* were lost when the vessel ran aground near Cape Bonavista, Newfoundland. Four other lives were lost in traffic accidents across Newfoundland as weather conditions deteriorated road conditions. All forecasts and warnings for this mid-latitude storm were handled by the Environment Canada regional weather centres; accordingly, the CHC did not issue any bulletins. The CHC issued 26 Hurricane Information Statements.

Some Environment Canada meteorological data:

- High winds along the Northeast coast of Newfoundland reached as high as 143 km/h (77 knots) (TTWS04)
- Bonavista reported winds of 120 km/h (65 knots) on Monday September 20th
- Twillingate recorded winds of reaching as high as 135 km/h (73 knots)
- At Twillingate, wind gust exceeded 111 km/h (60 knots) for nearly 31 continuous hours
- Gander received 91 continuous hours of precipitation, beginning on Saturday evening and continuing until Wednesday afternoon
- Rainfall totals from Sunday, September 18th through Thursday September 22nd:

Location	Rainfall Amount
Gander	157.6 mm (6.2 in)
St. John's	114.1 mm (4.5 in)
Stephenville	51.4 mm (2.0 in)
Deer Lake	47.6 mm (1.9 in)
Bonavista	154.5 mm (6.1 in)
Argentia	150.7 mm (5.9 in)
Badger	124.4 mm (4.9 in)
Winterland	85.5 mm (3.7 in)
Port Aux Basques	80.5 mm (3.2 in)
Twillingate	62.2 mm (2.5 in)
Englee	62.4 mm (2.5 in)
Burgeo	56.7 mm (2.2 in)
Daniel's Harbour	23.0 mm (0.9 in)

- Route 100 near Little Barasway River was reduced to one lane
- Route 94 near Admiral's beach had sections of it washed away
- Large trees in central Newfoundland were uprooted
- In the Botwood region, many coastal lying trees were damaged causing sporadic power outages

Newfoundland

September 21, 2004

- Heavy winds forced the Queen Mary 2 cruise vessel to cancel its first visit to Corner Brook (ET)
- Two crewmembers onboard the 20 m (65 ft) shrimp dragger *Ryan's Commander* were lost when it went aground near Cape Bonavista. The new vessel departed Bay de Verde and was travelling to Bonavista when it began taking on water 6 km (3.7 miles) off Cape Bonavista (ET)
- Waves in the Cabot Strait were averaging between 6-8 m (20-26 ft) (HH)

September 22, 2004

- Burgeo reported winds as high as 140 km/h (76 knots) (ET)
- Coastal Growers in Burgeo, a distributor of tomatoes in Western Newfoundland, lost approximately 12,000 pounds of their tomato crop and a 13.7 m by 36.5 m (45 ft by 120 ft) greenhouse. The greenhouse collapsed due to the high winds. The value of expected crop loss was estimated at *$20,000* and the greenhouse was valued at *$60,000* (ET)

- Two people were killed in a traffic accident that occurred along the Trans-Canada Highway west of Badger. Heavy rains and hydroplaning were determined to be a probable cause for the accident (ET)
- A accident near Salmonier Line claimed the life of one man and injured another lady when their vehicle flipped over a guardrail (ET)
- Another accident on the highway near Goobies took the life of a woman from Random Island. Road conditions were extreme at the time due to the weather conditions (ET)
- Several washouts were reported on the Greenspond Causeway, Twillingate Highway, The Beaches in White Bay and in regions of the Southern Shore (ET)

September 23, 2004

- Swells in the region of Cape Bonavista were reaching as high as 15 m (50 ft) (TC)
- Winds in the Cape Bonavista area reported to reach 110 km/h (59 knots) (ET)

Nova Scotia

September 21, 2004

- Power lines and trees where knocked down throughout Cape Breton (ET)
- Several schools were closed in Cape Breton (SP)
- Marine Atlantic delayed it ferry service between Nova Scotia and Newfoundland preventing 300 vehicles from crossing the Gulf (SP)
- Nova Scotia – Prince Edward Island ferry service was also delayed (SP)
- High winds and heavy fog forced the Queen Mary 2 to cancel its visit to North Sydney (ET)
- A resident of Campbell St. in Sydney had a tree topple into his home and uproot the sidewalk (HDN)
- Aliant reported that service interruptions to approximately 100 customers was a result of the storm (HDN)
- Several roads in Sydney were closed due to flooding and fallen power lines (HH)
- Sydney Airport received average winds reaching 54 km/h (29 knots) and wind gust reaching 80 km/h (43 knots) (HH)
- St. Paul Island located to the northeast of Cape Breton reported winds reaching 120 km/h (65 knots) (HH)

September 22, 2004

- Approximately 20,000 homes and businesses in the Cape Breton region lost power during the storm. (HDN)

September 26, 2004

- The only road leading to White Bay was nearly impassable due to high seas washing out many sections of the road (HDN)

Prince Edward Island

September 23, 2004

- Winds gusting to 100 km/h (54 knots) knocked down trees and tree branches across the island (G)
- The Confederation Bridge restricted some vehicles from crossing because of high winds (G)
- Scattered power outages were reported by Maritime Electric (G)

2004–Jeanne

Hurricane Jeanne developed on September 13th, 2004 near the Lesser Antilles and intensified into a category 3 storm. Jeanne contained winds reaching 195 km/h (105 knots). Jeanne traveled along the Caribbean Islands before making a 360° clockwise loop and landfalling in Florida. Eventually Jeanne curved northward and continued to track over the south-eastern states before entering the Canadian Response Zone on the evening of September 28th. Carrying winds at a maximum of 65 km/h (35 knots) Jeanne dissipated during the morning hours of September 29th. The CHC issued 18 Hurricane Information Statements.

2004–Karl

Hurricane Karl originated on September 16th, 2004 off the Cape Verde Islands in the Atlantic Ocean. Developing into a category 4 hurricane, Karl travelled across the Atlantic Ocean and gradually turned northward. Containing winds reaching 231 km/h (125 knots). Karl tracked slightly east of our response zone. The Rotterdam cruise ship on route to Halifax lost all power and was left stranded in the middle of the storm. Karl eventually began to weaken and was absorbed but an extra tropical low on September 28th.

September 28, 2004

- The Rotterdam cruise ship was located 900 km (560 miles) east of Newfoundland when the vessel lost power and stalled in the mid-Atlantic Ocean (CBC)
- When The Rotterdam arrived in Halifax, approximately 12 passengers received medical treatment, but their injuries were classified as non-life threatening (CBC)
- Waves were reported to be reaching as high as 10 -15 m (33-49 ft) (CBC)

2004–Nicole

Subtropical Storm Nicole formed on October 10th, 2004 south of Bermuda. The system did not develop into an intense tropical storm and contained a maximum wind of 83 km/h (45 knots). Nicole moved northward over the Atlantic Ocean entering the Canadian Response Zone on October 11th. However the storm quickly became absorbed by a low-pressure system that was already over the Atlantic region. These systems combined to bring strong winds and heavy rain to the Atlantic Provinces causing power outages and school closures. The CHC issued 7 Hurricane Information Statements.

- All four Atlantic provinces experienced winds of 90 km/h (49 knots) with gust reaching 100 km/h (54 knots) (TTWS04)
- Cape Breton experienced southwest winds as high as 130 km/h (70 knots) (TTWS04)
- Parts of Nova Scotia received as much as 40-60 mm (1.6-2.4 in) of rain (TTWS04)

Prince Edward Island

October 12, 2004

- Confederation Bridge restricted high-sided and trailer towing vehicles from crossing the strait due to high winds (G)
- Maritime Electric estimated that 5,300 customers where without power as Tropical Storm Nicole caused havoc with the main transmission line between Milton and Blue Shank Rd. (G)
- Maritime Electric's Hunter River, Rattenbury Rd., and West Royalty substations where affected by the storm (G)
- Power lines in the Stratford area and the transmission line from Dunstaffnage to Bedford were also affected by the storm (G)

Nova Scotia

October 12, 2004

- Tree branches knocked power lines down in the Oxford St. and LeMarchant St. area creating power outages in the south end of Halifax (HDN)
- Halifax Regional Police reported minor traffic problems due to heavy rains (HDN)

- Annapolis Valley reported that high winds uprooted trees and ripped down power lines in the area (HDN)
- Several schools in the Annapolis Valley area were closed (CBC)
- Near Ingonish, a section of the Cabot Trail was closed due to flooding (CBC)
- 350 people were stranded at the Marine Atlantic Ferry Terminal in North Sydney due to cancellation of ferry service (CTV)

New Brunswick

October 12, 2004

- NB power reported that approximately 6,000 customers were without power (CBC)

REFERENCE SOURCES FOR 2004 STORMS

(ET)	-	*Evening Telegram, St. John's, NL*
(G)	-	*The Guardian, Charlottetown, PEI*
(HH)	-	*Chronicle Herald, Halifax, NS*
(TJ)	-	*Telegraph Journal, Saint John, NB*
(MG)	-	*The Gazette, Montreal, QC*
(TS)	-	*Toronto Star, Toronto, ON*
(GM)	-	*Globe and Mail, Toronto, ON*
(DFP)	-	*Dartmouth Free Press, Dartmouth, NS*
(KWS)	-	*Kingston Whig Standard, Kingston, ON*
(BB)	-	*Bridgewater Bulletin, Bridgewater, NS*
(LPE)	-	*Lunenburg Progress Enterprise, Lunenburg, NS*
(OC)	-	*The Ottawa Citizen, Ottawa, ON*
(TR)	-	*The Register, Berwick, NS*
(TWS)	-	*The Windsor Star, Windsor, ON*
(SS)	-	*Sudbury Star, Sudbury, ON*
(HDN)	-	*Halifax Daily News, Halifax, NS*
(NP)	-	*National Post, Don Mills, ON*
(SP)	-	*Star-Phoenix, Saskatoon, SK*
(TC)	-	*Times-Colonist, Victoria, BC*
(CTV)	-	*CTV News Online*
(CBC)	-	*Canadian Broadcasting Company*
(SLRB)	-	*St. Lawrence River Board of Control, Ottawa, ON*
(TTWS04)	-	*Top Ten Weather Stories of 2004, MSC*

Environment Canada
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Meteorological Service of Canada (Atlantic)
Service Météorologique du Canada (Atlantique)